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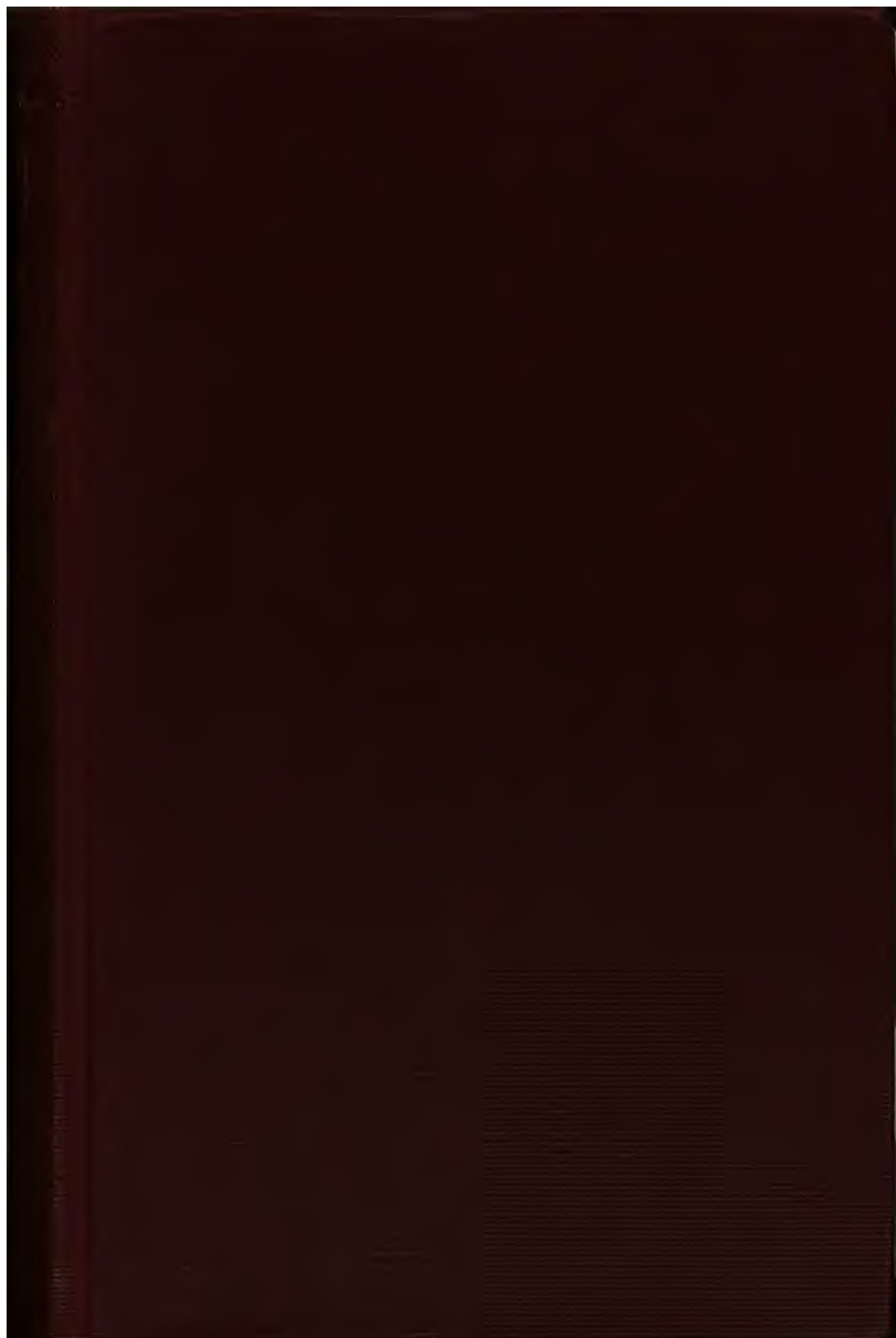
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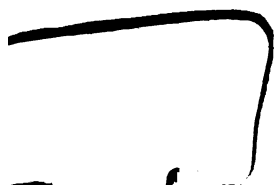
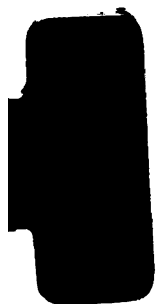
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INVESTIGATION OF PANAMA CANAL MATTERS.

HEARINGS

BEFORE THE

COMMITTEE ON INTEROCEANIC CANALS

OF THE

UNITED STATES SENATE

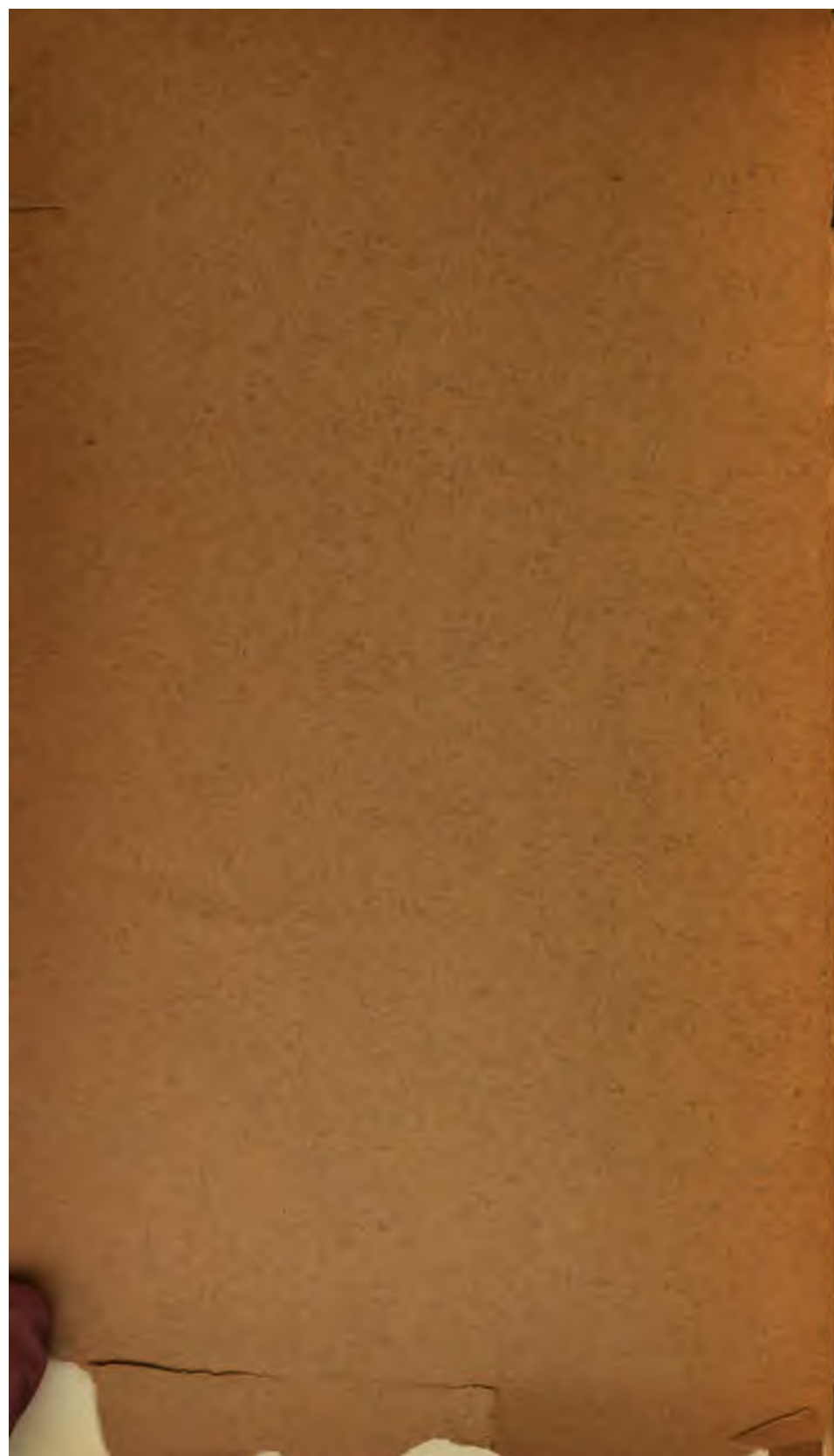
IN THE MATTER OF THE SENATE RESOLUTION
ADOPTED JANUARY 9, 1906,

PROVIDING FOR

AN INVESTIGATION OF MATTERS RELATING
TO THE PANAMA CANAL, ETC.

Vol. II.

WASHINGTON:
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ISTHMIAN CANAL.

COMMITTEE ON INTEROCEANIC CANALS,
UNITED STATES SENATE,
Washington, D. C., Tuesday, February 20, 1906.

The committee met at 11 o'clock a. m. (no session having been held on yesterday).

Present: Senators Millard (chairman), Kittredge, Dryden, Hopkins, Ankeny, Morgan, and Taliaferro.

TESTIMONY OF DAVID W. ROSS, ESQ., GENERAL PURCHASING OFFICER ISTHMIAN CANAL COMMISSION.

Mr. Ross was duly sworn, and testified as follows:

The CHAIRMAN. Mr. Ross, will you give your name?

Mr. Ross. David W. Ross.

The CHAIRMAN. And your residence?

Mr. Ross. Washington at present. Chicago is my legal residence.

The CHAIRMAN. What has been your business for, say, the past eight or ten years?

Mr. Ross. Up until the 1st of June, when I came with the Canal Commission, I had been with the Illinois Central Railroad for eighteen years, located at Chicago.

The CHAIRMAN. In what way were you employed by the Illinois Central Railroad?

Mr. Ross. I started with the Illinois Central eighteen years ago in the telegraph department and was in that department for over a year, and afterwards in the general superintendent's and general manager's office and president's office, respectively, for several years. Then I was for ten years in the office of the second vice-president, first as his secretary, and for six years as chief clerk to the second vice-president. I was then purchasing agent for three years, and for the last year, from June 1, 1904, until June 1, 1905, I was general superintendent of transportation.

The CHAIRMAN. And where were you stationed at that time?

Mr. Ross. At Chicago.

The CHAIRMAN. Were you general superintendent of transportation for the entire line?

Mr. Ross. Yes, sir.

The CHAIRMAN. And what time did you take up service with the Commission?

Mr. Ross. June 1, 1905.

The CHAIRMAN. And what are your duties with the Commission now? What is your position?

Mr. Ross. General purchasing officer of the Commission.

The CHAIRMAN. You do all the buying for the Commission?

Mr. Ross. Yes, sir.

The CHAIRMAN. Do you buy for the Panama Railway also?

Mr. Ross. I am also general purchasing officer of the Panama Railroad; yes, sir.

The CHAIRMAN. You are the general purchasing agent for both?

Mr. Ross. Yes, sir.

The CHAIRMAN. Now will you go on and state to the committee in a general way what your duties are?

Mr. Ross. I might state, in the first place, the conditions as I found them when I came here.

The CHAIRMAN. Yes.

Mr. Ross. Major Gallagher had been purchasing agent from February 1 until June 1, 1905, when I came with the Commission. He found quite a large lot of accumulated requisitions, and had done good work in getting them advertised and in opening bids. But when I came here there were a great many bids that had been opened on which they had not had time to award the contracts, and I spent nearly all of my time from the 1st of June until I went to the Isthmus with Mr. Shonts and Mr. Stevens, on the 20th of July, in getting awards made on the bids that had been opened. By the time I left to go to the Isthmus in July we were pretty well up to date.

I went to the Isthmus on the 20th of July, and while down there the material and supply division on the Isthmus was placed in my charge. That is the same as the store department on railroads. It had been under the chief engineer, but Mr. Stevens said he did not want it, and that he preferred—

Senator ANKENY. Mr. Ross, do you advertise for all the purchases made there?

Mr. Ross. Made here?

Senator ANKENY. No; for the Panama Commission, wherever they are made.

Mr. Ross. Yes, sir; practically all. The requisitions, of course, are all made on the Isthmus. They come up to this office. If we have enough to warrant advertising, we always advertise. Sometimes we get in on a steamer a requisition for only thirty-five or forty or fifty dollars' worth of stuff; and in that event it would not pay to advertise. We do buy a small amount of little stuff in that way without advertising. Under the President's instructions we have authority to purchase up to \$1,000 worth of material without advertising, but we practically pay no attention to that provision, because if we get in a lot of different requisitions on a steamer we get out an advertisement for all of the material called for without trying to pick out something that we could buy under that authority without advertising.

Our total purchases in the open market from February 1 to October 1, as shown in a statement which was prepared for the Secretary of War, and of which I have a copy with me, were about \$280,000; and I think from February 1 up to date the total purchases in the open market, without advertising, will not exceed about 4 per cent of the material purchased, and at least half of that 4 per cent is material that we could not buy in any other way.

Senator ANKENY. That amount would be how much?

Mr. Ross. I presume that from February 1, 1905, to February 1, 1906, it would probably run about \$350,000.

Now, I say, that is probably about 4 per cent of the purchases. Of that 4 per cent at least half is material that we could not buy in any other way. It is repair material for machinery that we already have down there, for steam shovels, cars, locomotives, or equipment of that kind, where we have to buy the repair parts from the people who originally made such equipment. We do not always have to do so. We can sometimes buy repair parts for such equipment from people other than those who originally furnished it.

Senator ANKENY. These are what you call extras for special machinery?

Mr. Ross. Yes, sir. There are, however, a great many things that have to be bought from the people from whom you originally bought the machinery; and at least half of our open purchases are made in that way, because we can not buy the material in any other way and it would be a perfect farce to advertise for bids on it.

Senator TALIAFERRO. Did you say you had a statement in your pocket of the purchases from February to October?

Mr. Ross. Yes, sir; I have it here, and I will give it to you [producing statement]. This is gotten up to show just what was done with each requisition, in what papers it was advertised, the number of days it was advertised, and whether or not the award was made to the lowest bidder; if it was not made to the lowest bidder, the reason for not making it to the lowest bidder; and at the end is a statement showing the materials purchased in the open market without advertising, and the reasons for so purchasing them.

The CHAIRMAN. Does that statement show all the purchases made in that time?

Mr. Ross. In that time; yes, sir.

The CHAIRMAN. There is a good deal to that statement. Had it better go in the record?

Senator TALIAFERRO. I do not think the whole of it should go in the record.

Mr. Ross. That was prepared for use when we asked for the appropriation, and a copy of it was given to the Senate Committee on Appropriations.

The CHAIRMAN. They probably have a copy of it there.

Mr. Ross. They have a copy of it; yes, sir.

The total purchases from February 1, 1905, to February 1, 1906, were about \$7,600,000; and the material purchased in the open market without advertising in that time was about \$350,000. You will note this statement does not cover that whole period.

The CHAIRMAN. That covers all purchases of every nature—locomotives, rails, and everything?

Mr. Ross. Yes, sir; it covers everything.

The CHAIRMAN. And you do the buying—you buy everything?

Mr. Ross. Yes, sir. When we get the requisitions in we get them out in this form. I have here a copy of each of the circulars gotten out since I have been with the Commission. At the head is shown the advertisement that we insert in the newspapers throughout the country in all the large cities—Boston, New York, Philadelphia,

Baltimore, Pittsburg, Cleveland, Chicago, St. Louis, Louisville, Cincinnati, Atlanta, New Orleans, San Francisco, and Portland or Tacoma, sometimes one and sometimes the other.

Senator DRYDEN. Do you, in addition to that, bring the matter to the particular attention of the dealer or the manufacturer of the particular article that you are soliciting bids for?

Mr. Ross. We do in the large purchases.

Senator DRYDEN. By direct communication?

Mr. Ross. Yes, sir. Now, this advertisement shows the articles that we are in the market for. It also shows where these circulars may be obtained. I will show you what it says about that. After reciting that we are in the market for certain things, it contains this clause: "Blanks and full information may be obtained from this office or the offices of the assistant purchasing agents, 24 State street, New York City; custom-house, New Orleans; 36 New Montgomery street, San Francisco, Cal., and 410 Chamber of Commerce Building, Tacoma. Also from chief quartermaster, Department of the Lakes, Chicago; depot quartermaster, St. Louis; depot quartermaster, Jeffersonville, Ind.; chief quartermaster, Department of the Gulf, Atlanta, Ga., and the Commercial Club, Mobile, Ala."

Originally, when I first came here, the circulars were only being distributed through the offices of the assistant purchasing agents; there was no means of distributing them in Chicago, for instance, or St. Louis, or any of the other places just mentioned. Bidders located there had to send to Washington, or to New York, or to New Orleans for the circulars which show the quantities and descriptions of the materials wanted; so I had the matter taken up through Quartermaster-General Humphrey's office, and he issued authority for the quartermasters I mentioned to distribute our circulars for us.

Senator ANKENY. Army quartermasters?

Mr. Ross. Yes, sir. They distribute for us, by mail or otherwise, these circulars to anybody who applies for them in response to the advertisements. They do good work for us.

The CHAIRMAN. Those bids are all sent here?

Mr. Ross. They are all opened here.

The CHAIRMAN. Yes; they are all mailed to this office.

Mr. Ross. The idea in that is this: That when we get our requisitions in here, if we were to send some of them to New York and some to New Orleans and some to San Francisco we would be paying a great variety of prices for the same thing; while by having them all opened in Washington we get the lowest price that we can get in any of the sections of the country. We get competition from all over the country on the same thing, and get the lowest price that we can get. I will give an instance of what might happen if we were to send part of our requisitions to one place to be purchased and part to another.

Senator ANKENY. Do these bids contemplate delivery on the Isthmus or in Washington?

Mr. Ross. We request all bids to be based on delivery at the Isthmus, either at the Atlantic port or the Pacific port.

Just to show you the advantage of having the bids opened in one place, I will state that we advertised three or four months ago for some forage, and the prices obtained on the Gulf coast, as compared with the Pacific coast, were just about one-half—a trifle more than one-half. If we had sent the requisitions out to the Pacific coast

and only advertised there we would have paid nearly twice as much as we did pay by advertising all over the country and getting the lowest bid we could get. Of course that is just an instance. It might be true to the same extent about anything else, and on some other things the bids might be much lower on the Pacific coast than on the Gulf coast. But all of the bids are opened here, except that once in a while we get a cablegram from the Isthmus asking for something they wanted to go down on the next steamer, perhaps. In that event, if there is a steamer sailing from New York or New Orleans in a few days, and it is something that does not amount to much, we buy it in the open market, as I have said before.

We send out and get bids from everybody we know anything about and can reach in time and we post a circular in a public place, so that anybody that wants to can see it; and a great many people make a habit of going around to the offices and looking up those things. Even in the case of these so-called emergency purchases we do that. But, as I said before, the emergency purchases do not amount to very much now.

I thought it might be well to call the attention of the committee to the difference in the situation as to purchases for the Canal Commission and purchases for most of the other departments, or for railroads. There is quite a difference, for this reason: The Canal Commission, six or eight months ago, at least, had practically no stock of anything on hand, and nearly everything they wanted they wanted badly, because they were waiting for it. They had nothing to go on until they got it. So that nearly everything we have been buying is really emergency material, although we have been advertising for it.

Before I went to the Isthmus the first time we were advertising thirty days for nearly everything; but after I got down there and got to talking with the heads of the departments and others, heard what they had to say about delay in getting material and found out the necessity for it, I thought possibly we might cut down the time of advertising a little, and when I got back here I looked into the matter, and, as a rule, now we advertise about twenty days, unless it is for something on which it requires more time than that to prepare bids.

The CHAIRMAN. Does twenty days give ample time for you to hear from people from one side of the country to the other?

Mr. Ross. It does. We telegraph our advertisements out to the coast, as a rule, and get the circulars out there as soon as we can. It allows them, as a rule, at the extreme points out in California and Washington and Oregon, about ten days to prepare bids.

The CHAIRMAN. You can reach any point that you want to in about four days, can you not?

Mr. Ross. Yes; but about twenty days is as little as we ought to advertise, I think, as a rule. That is about what we have been doing ever since I got back from the Isthmus the first time, except in the case of large items, where people need more time in order to prepare their bids, and where they have to get up specifications and plans themselves; then we allow more time. Once in a while, on one or two occasions, I have not allowed as much time as bidders thought they ought to have in order to bid intelligently and I have extended the time first fixed for opening.

Senator DRYDEN. Do you remember in about how many papers you advertise for bids?

Mr. Ross. I should say about a dozen—twelve or fifteen papers.

Senator DRYDEN. Throughout the country?

Mr. Ross. Yes, sir; about fifteen, I should think.

Senator DRYDEN. You aim to select leading papers in the different localities, I suppose?

Mr. Ross. I have done this about the advertising: When I first came here I found we were advertising from four to six times in a much smaller number of papers than I am advertising in now—not as extensively throughout the country; only in large cities like Chicago, Philadelphia, New York, New Orleans, and San Francisco. I cut down the number of insertions; we put two insertions in each of these papers, so that the total cost of the advertising is not really any greater than it was before; but we advertise over a larger field and get the circulars distributed more widely. In the case of the bids opened yesterday we first had 2,000 of the circulars printed, and about a week before the opening we did not have one left. We had sent out all of them from this office.

Of course we send a supply as soon as they are printed to all of the other distributing offices I have mentioned. We send a supply to all of them; and in this case nearly all the other offices to which we had sent them—the other branch offices—were out of them, so I had to get another supply printed. We sent out 2,500, and as a result of sending out 2,500 we got in about 160 bids yesterday; and it took from about half past 10 yesterday morning until 2 o'clock yesterday afternoon to open and read them.

Senator DRYDEN. Have you had any complaints from the dealers or manufacturers that they have not been properly advised of the wish of the Commission for bids?

Mr. Ross. I do not know that we have. We get letters from concerns occasionally saying that they did not have a chance to bid; but it is usually their own fault, largely, having had the same opportunities that everybody else had. Of course it is not possible for us to know, here, everybody in the country that might be able to bid on a certain thing.

I think the idea of advertising in the newspapers is a good thing for the Government offices to do, because it is not possible for anyone to know all the concerns in the country that might bid on a certain thing. You might know who would bid to-day, but two months from now a lot of new concerns may have started. So that by advertising everybody has a chance to know that you are in the market for the things advertised. We not only advertise in the daily papers, but the advertisements are put in a paper published here in Washington called the Government Advertiser, which nearly everybody bidding on Government business takes. That paper publishes all of the advertisements, not only of the Canal Commission, but of the Navy Department and all of the Government Departments, and a great many advertisements of States and municipalities, and some private corporations. It also publishes all of the awards made by the different Departments after the bids are opened.

Senator DRYDEN. There would be two elements that would enter into the purchase of supplies, especially of large and important or-

ders. First, as to the facility for prompt delivery, and second, as to the quality of the goods.

Mr. Ross. Yes, sir.

Senator DRYDEN. And of course you recognize the importance of getting your requests for bids before the prominent and reliable dealers?

Mr. Ross. Yes, sir; and when there is anything up that is of very large moment I do not wait for them to ask for circulars.

Senator DRYDEN. You send them direct?

Mr. Ross. I send them direct.

Senator DRYDEN. That is what I really wanted to get at—if you took pains to get your notices before the responsible and prominent people.

Mr. Ross. For instance, we bought a short time ago 5,000 tons of steel rails. We advertised for it, of course, because it was a large item; but in addition to that I wrote to every concern in the country that makes steel rails—standard section steel rails—and called their attention to our advertisement and asked them to make bids; told them we hoped to have them make bids. I telegraphed to the Colorado Fuel and Iron Company, as I thought possibly they might want to bid, calling their attention to our advertisement and asking them to bid; and I got a reply from every one of the companies that could bid on standard section steel rails. But I only received two bids.

Senator HOPKINS. Where you have large orders to give out, do you find among dealers a tendency to combine and have only one bid or two bids?

Mr. Ross. No, sir; I have not really noticed any tendency in that direction.

Senator HOPKINS. You think that the bids that have come in have been honest bids, as they would be if you were dealing for the Illinois Central or any other great concern?

Mr. Ross. Yes, sir; I do.

Senator TALIAFERRO. How do you account for the fact, Mr. Ross, that you only got two bids for the steel rails?

Mr. Ross. There were really only two or three concerns that were in shape to bid. The others were pretty well sold up. Outside of the concerns represented by the United States Steel Products Export Company, which handles the export business of the United States Steel Corporation, there are only about three or four companies that make standard section steel rails. They are the Colorado Fuel and Iron Company, the Tennessee Coal and Iron Company, the Republic Iron and Steel Company, who have only recently commenced to make standard section steel rails—they have been making light section rails for some time—and the Maryland Steel Company. The only bids we got were from the Maryland Steel Company and the United States Steel Corporation, or the United States Steel Products Export Company.

The Tennessee Coal and Iron Company said that they were booked up for a considerable time in advance and could not bid and could not give us the delivery we wanted. The Republic Iron and Steel Company said the same thing. The Colorado Fuel and Iron Company said that they were not in shape to bid, but I imagine they thought that there would not be much use in their bidding. They are quite a long distance from the seaports, you know.

Senator ANKENY. These were bids for the railroad?

Mr. Ross. No; these were for the Canal Commission.

Senator ANKENY. You bought these rails for the Canal Commission?

Mr. Ross. Yes, sir.

Senator HOPKINS. But they were to be shipped from New York?

Mr. Ross. We asked for bids delivered on the Isthmus and also delivered at a seaport—not any particular seaport, but at any seaport in this country. When the bids came in I accepted a bid for delivery at a seaport in this country, because I found that they were allowing for more freight from the seaport in this country to the Isthmus than we would have to pay ourselves.

Senator HOPKINS. What company got that award?

Mr. Ross. The United States Steel Products Export Company. We made our own freight arrangements, and saved about \$1 or \$1.50 a ton by buying at a seaport in this country.

Senator MORGAN. Who decides between the bids, as to their acceptance?

Mr. Ross. I generally confer with the chairman.

Senator MORGAN. Of the Commission?

Mr. Ross. Of the Commission; yes, sir.

Senator MORGAN. You say "generally." Is that in a majority of the cases?

Mr. Ross. That is in all of the large items.

Senator MORGAN. In the large items?

Mr. Ross. Yes, sir.

Senator MORGAN. A very large part of this purchasing is done by your acceptance of bids without consultation with anybody, then?

Mr. Ross. Of the small miscellaneous stuff; yes, sir.

Senator MORGAN. It amounts to a very large sum in the aggregate, does it not?

Mr. Ross. It amounts to quite a large sum.

Senator MORGAN. Running up into millions of dollars?

Mr. Ross. I suppose that the small miscellaneous stuff would amount, since I have been here, to probably a millions dollars or more.

Senator MORGAN. I just wanted to get at the nature of your duties, and to know what powers and privileges you have in the matter. I am not, by any means, undertaking to cast any suspicion or slur upon your competency or your fairness in dealing.

Mr. Ross. I might explain that when these bids are received they are opened in public in my office on the first floor. We have usually quite a number of the bidders present, and a record is made of the bids there. The awards, the names of the bidders, and the amounts of their bids are all published in the paper called the Government Advertiser, that I mentioned a while ago; so that all of the bidders, whether they are present or not, know later the bids made by their competitors. Of course they can be present if they want to; but as a rule, of course, only the people in the East or concerns who have agents in Washington are present.

Senator HOPKINS. Who publishes this medium in Washington that you speak of?

Mr. Ross. It is a private concern. I do not know the names of the people who publish it. It has been running for some years, though,

I believe. They make no charge to any of the Government officers for printing their advertisements. They make their profit, I presume, out of their circulation.

Senator HOPKINS. Do you know whether that publication is owned by a few contractors that have entered into a combination for the purpose of controlling the Government work in all the various Departments as far as they can?

Mr. Ross. I never had heard so.

Senator HOPKINS. You do not know anything about it?

Mr. Ross. I do not know anything about it. I do not see what benefit that paper would be to them, though, really.

Senator HOPKINS. Have you discovered, in the bids that you have had from time to time since you have been the purchasing agent, that certain parties in New York and certain parties in other sections of the country are the only ones that bid, and that their bids are almost alike?

Mr. Ross. No; I have not discovered that. If we only advertised in one certain section of the country—if we only advertised east of the Mississippi River, for instance, or in New York, or that vicinity—there would possibly be an opportunity for an agreement of that sort.

Senator HOPKINS. But this advertising medium here in Washington is owned by men that make their money out of Government contracts, is it not? It is owned by people that devote their entire time to Government contracts?

Mr. Ross. Well, I do not know who owns it. It is not published by the Government.

Senator HOPKINS. Yes; that is what I understand.

Mr. Ross. It is a private concern.

Senator HOPKINS. My understanding is that it is published by private parties, and private parties who are constantly bidding for Government work of one kind or another.

Mr. Ross. Not that I knew; I did not know that.

Senator HOPKINS. You do not know as to that?

Mr. Ross. I do not think that any of the people who are bidding on the supplies for the Government are interested in that paper at all. I never had any idea that they were. I know the people representing the paper that come around to our openings and get the information never take any interest in any of the bids. They never make any inquiries about them, or appear to represent anybody.

Senator HOPKINS. Do you know whether this is a paper that has a general subscription circulation?

Mr. Ross. I think it has.

Senator HOPKINS. You think it has?

Mr. Ross. There is where they make their money. They have, I imagine, quite a large subscription all over the country. The paper has been established, as I understand it, for a number of years. I have a copy of it here.

Senator HOPKINS. In regard to the parties that bid for these different supplies that you send to the Isthmus, has your attention been called to the matter so that you have noticed whether they are parties that bid for naval supplies and supplies for the War Department and for the other different Departments?

Mr. Ross. We do, of course, get bids from a good many concerns that bid for the Navy Department or for the other Departments; but

I think we get, as a rule, a great many more bids than they do, because we advertise all over the United States. In this opening that we had yesterday morning we had bids from nearly every State in the United States—from California, Oregon, Washington, and those Western States, Indiana, Illinois, Michigan, Ohio, all of the Gulf States, and all of the Eastern States. I think we had bids yesterday from nearly every State in the United States, with the exception of four or five; so that if they wanted to get together—

Senator HOPKINS. You think there is no combination among the people that are supplying these various manufactured products for the Government? You have discovered no combination between them?

Mr. Ross. No; I have not. I think it would be pretty hard for them to work up such a combination, on account of the wide advertisement which we give our wants and the large number of bids which we get from all sections of the country. If the bidding on our requirements was confined to a certain small section of the country, that might likely happen, I think; but if a few bidders in the East, for instance, were to make an agreement that one would bid low one time and another one the next, and in that way keep the prices fairly high, they would be let out of it by somebody who was not in the deal making a lower price.

In making our awards, of course, we not only consider the price, but we have to take into consideration the quality and the time of delivery. We print after each of our items here, or each of the classes, a clause reading, "Will commence shipment, class 1," for instance (the same way with each one), "within —— days, and complete the same within —— days after receipt of notice of award." And at the end we state that the time of delivery will be considered in making the award as well as the price, so that people who are bidding will look out for that and give us as good deliveries as possible.

Senator HOPKINS. What has been your experience in this respect: Where you have advertised for the same article at different periods during the time that you have been purchasing agent do you find that the same firm is the one that gets the bid each time?

Mr. Ross. No, sir. It changes around a great deal. There has not been very much of that. It not only changes around so far as firms are concerned, but as far as sections of the country are concerned. Sometimes the people in New York or the East will get a certain lot of material, the next time we advertise for it perhaps some Gulf coast or Pacific coast people will get it.

I would like to show you some of these papers. There is a list of the persons to whom we sent these proposals or circulars on the last opening from the Washington office alone, and, of course, we distribute them through eight or nine other offices in addition to this.

Senator DRYDEN. Do you remember how much money this order involved?

Mr. Ross. It was not a very large amount of material. There were a great many items, but they were small items—probably about \$75,000 to \$100,000 in all. We use the other Departments of the Government as far as we can, and they have been very nice about it and have helped us out in a good many ways. If we occasionally want something in an emergency and we find that some other Department has it in stock, we occasionally get it from them. We have

been helped by the Quartermaster's Department of the Army in that way occasionally.

Senator HOPKINS. I want to ask you another question or two, if it does not interrupt the thread of your discourse, regarding this paper, which I see is called the "U. S. Government Advertiser." What is the understanding among the trade? Is it that this paper is published by the United States Government?

Mr. Ross. No, sir; they know that it is a private concern. A few people write to me occasionally with the idea that it is a Government paper, and want to know to whom they should apply to have it sent to them, but as a rule nearly all the people know that it is a private concern.

Senator HOPKINS. Does this paper favor certain large concerns that furnish supplies to the Government, do you know, in the way of its advertising, or in any of the articles that appear in it, or is it all advertising?

Mr. Ross. It is nearly all advertising, you see. There is very little in it except advertisements and notices of the awards made after public openings. I think it is purely a commercial proposition. I have never heard of any large bidders for Government materials being interested in it, and their representatives never evidence any interest in the bids of any particular people at all.

Senator MORGAN. On a page of this paper that you have submitted to the committee, which is not numbered, I notice a memorandum in pencil, and I want to know whether that is a part of the statement that you submit. The memorandum reads: "This contract transferred to Panama Railroad and Steamship Company."

Mr. Ross. Yes, sir; "Panama Railroad Company."

Senator MORGAN. Yes. The contract appears to be "Fairmont Coal Company, coal, \$185,000." Is that \$185,000?

Mr. Ross. Yes, sir.

Senator MORGAN. "Advertised twenty-nine days," etc.—advertised in various papers.

Mr. Ross. Yes, sir.

Senator MORGAN. Why was that contract transferred to the railroad company?

Mr. Ross. Because Mr. Stevens and Mr. Shonts, who were on the Isthmus at the time that coal first started to go down there, thought it would be better not to have the Commission receiving coal and the Panama Railroad receiving coal also; that it would be likely to cause unnecessary confusion and bookkeeping, and it was thought best to have either one or the other receive all the coal used by the two concerns—the railroad and the Commission. As the railroad was in better position to handle it and had been handling it for a good many years, after talking the matter over with Mr. Stevens, Mr. Shonts asked me to have the contract which the Commission had made for coal turned over to the Panama Railroad, and the Panama Railroad is handling it and furnishes the Commission with coal. It is a better arrangement, for this reason: That the coal is unloaded and put on the Panama Railroad Company's property there and they use it indiscriminately. Their engines use it, and when they want to furnish the Commission any, they load it up and weigh it and deliver it to the Commission. There is less bookkeeping about it than there would be if the Commission furnished them with coal.

Senator MORGAN. What was the date when this contract was transferred?

Mr. Ross. It was transferred about the 1st of October.

Senator MORGAN. Of what year?

Mr. Ross. Of 1905.

Senator MORGAN. From that date forward the purchases of coal for the consumption of the canal authorities and for use in the canal work have been made by the railroad company?

Mr. Ross. Yes, sir. This was the only purchase of coal ever made by the Commission. The Panama Railroad Company had always purchased the coal before.

Senator MORGAN. This was the only one made?

Mr. Ross. This was the only one made.

Senator MORGAN. I notice several others in here that appear to be purchases. I do not know whether they were before or after that date.

Mr. Ross. This is the only purchase of coal the Commission has ever made. These other purchases were for different materials.

Senator MORGAN. No; this is coal in the various places here, I think. Let me see a moment.

Mr. Ross. You will not find any other coal, Senator. That was the only purchase of coal ever made by the Canal Commission.

Senator MORGAN. What is meant by transferring the contract?

Mr. Ross. The Panama Railroad assumed the contract.

Senator MORGAN. Yes; it assumed the contract. You made the contract?

Mr. Ross. Yes, sir.

Senator MORGAN. And turned over the payment and the receipt of the coal?

Mr. Ross. They made their invoices against the Panama Railroad instead of against the Isthmian Canal Commission.

Senator MORGAN. So that it was a mere transfer of the transaction?

Mr. Ross. Yes, sir.

Senator MORGAN. And from that time forward the Panama Canal Company furnished all the coal?

Mr. Ross. The Panama Railroad Company.

Senator MORGAN. The Panama Railroad Company, I mean, furnished all the coal for all the operations in which coal is used on the Isthmus?

Mr. Ross. Yes, sir. I might explain a little further there, as long as we are on that subject. That was a contract made for 50,000 tons of coal of a different grade from what they had been using before, and on that account we made a provision that we would take 10,000 tons of coal, and if it proved to be satisfactory and better for us all around as to price and quality, both being considered, we would take the remainder of the 50,000 tons, but if not, if the first 10,000 tons was not satisfactory, we would not have to take more than the 10,000 tons.

That coal went down to the Isthmus, and a very careful test was made as compared with the coal we had been using before; and even though this coal was purchased about 30 cents a ton cheaper than the other coal, the test showed that it was more expensive to us; it cost us more money than the other coal did, because we did not get the results out of it that we did out of the other coal. By that time we had

shipped down about 4,000 tons of this coal, and, while they could have compelled us to take 10,000 tons if they wanted to, they allowed us to cancel the contract, and allowed us to take less than 10,000 tons.

Senator MORGAN. Where is the Fairmont coal mined?

Mr. Ross. That is mined in West Virginia.

Senator MORGAN. West Virginia?

Mr. Ross. Yes, sir.

Senator DRYDEN. Does the Commission pay the railroad company just the same price for this coal, no more and no less, that it costs the railroad company?

Mr. Ross. The Commission pays the railroad company just the actual cost of the coal, the freight down there, and the cost of handling it there; so that it really does not make a particle of difference. If the railroad company did not handle it, they would have to handle it.

Senator MORGAN. They buy coal from the railroad just as they would from any private company?

Mr. Ross. Yes, sir.

Senator MORGAN. Delivered at the place?

Mr. Ross. Yes, sir. I saw a statement the other day to the effect that the Panama Railroad practically had a monopoly of the coal business down there. I do not understand that there is any reason why they have a monopoly. Any dealer in Colon that wanted to buy a cargo of coal and send it down there could do it.

Senator MORGAN. That had reference to the supply of the Government. The Panama Railroad Company does supply the Government with all of the coal it uses?

Mr. Ross. It supplies the Canal Commission; yes, sir; and they supply the naval vessels that want to go in there for coal.

Senator MORGAN. Then, besides that, they have an open market, if they want to engage in it, to sell to the cities of Panama and Colon?

Mr. Ross. Yes, sir. There is no reason why a dealer in Colon, for instance, if he wanted to go into the coal business on his own account, could not get a cargo of coal down there.

Senator MORGAN. Yes; he can get the coal from anybody he wants to; but practically, I suppose, the Panama Railroad Company supplies the markets of Colon and Panama with coal.

Mr. Ross. I do not know about the towns of Colon or Panama, whether the merchants get coal from us or not. I do not think they do. The steamship lines get coal from us on the Colon side, and the Pacific Mail does on the Pacific side. The Pacific Steam Navigation Company, I think, use Australian coal.

Senator HOPKINS. That comes, I suppose, from the fact that the railroad company can handle it with greater facility and can fill the orders more quickly than a company either at Colon or at Panama for the steamship lines?

Mr. Ross. Yes; and then the Panama Railroad Company pays more attention to the quality of coal they purchase than the ordinary dealer down there would, and they get a better grade of coal.

Senator MORGAN. Mr. Chairman, I have been looking over this list of purchases and prices and advertisements, and so forth, and it seems to cover the whole field of purchases there generally. I think it would be a very useful document to be printed as a separate document

by the Senate and allowed to go to the country; and if there is no objection to it, I will ask that the chairman be requested to ask the Senate to print this as a separate document.

The CHAIRMAN. You do not desire it to go into the record at all?

Senator MORGAN. No; I think it had better be printed as a separate document by the Senate and not encumber the record with it. We have very little use for it, but there are other people who will have a great deal of use for it.

Senator ANKENY. This last purchase of coal contained what proportion of Pocahontas?

Mr. Ross. That last purchase of coal was Fairmont coal.

Senator ANKENY. It did not include any Pocahontas?

Mr. Ross. Not any Pocahontas. The Panama Railroad Company's last purchase of coal was Pocahontas coal.

Senator HOPKINS. In purchasing coal I suppose you have the same tests that the Navy Department has, or practically the same?

Mr. Ross. Of course the Panama Railroad has had quite a long experience with coals and has had tests in actual service of a number of different grades of coal—Pocahontas, New River, and this recent test of Fairmont coal. The Navy Department has been making tests of coal for a good many years, and I have looked over a large number of their tests of coals from all over the country. They make chemical analyses of coal all the time at their navy-yards and tests in actual service in their stationary engines. In 1898 they sent an inquiry to the commander of each vessel in the Navy and asked him to give them the result of his experience as to which American coal had proven to be the best for all purposes. They received 123 answers, and out of that number 117 said they preferred Pocahontas coal; two of the remaining six said they preferred either Pocahontas or New River; another man said that he preferred bituminous coal. [Laughter.] He was not very specific about it. Another one said that, on account of the type of the boilers on his vessel, he preferred anthracite coal; and as to the other two, I have forgotten what they said.

Senator MORGAN. What year was that?

Mr. Ross. Eighteen hundred and ninety-eight. But that sort of report really does not amount to much, because, out of the 117 men who said they preferred Pocahontas coal, there might have been three-quarters of them that had not used anything else very much, so that such a report is not conclusive.

Senator HOPKINS. I have had the impression that the Navy Department subjected the coal to chemical tests.

Mr. Ross. Yes; they do.

Senator HOPKINS. And the impression that I have had all along is that their tests are of the highest and most useful character in determining which class of coal should be purchased.

Mr. Ross. They are. The Panama Railroad has been purchasing Pocahontas coal for some time.

Senator MORGAN. Up to date you have had no use there for coal except for steaming purposes, have you?

Mr. Ross. The principal use we have for coal, of course, is for use in stationary engines and in locomotives.

Senator MORGAN. Yes. That is all for steaming purposes.

Mr. Ross. Very little is used for any other purpose down there.

Senator MORGAN. You do not need any for domestic comfort?

Mr. Ross. No; we do not need any for fires in caboose cars or for heating buildings down there. [Laughter.]

Senator TALIAFERRO. I notice you left a copy of this proposal with the Danish legation and with the German embassy and with the French embassy?

Mr. Ross. Yes, sir.

Senator TALIAFERRO. What was the object of that?

Mr. Ross. We send them to all of the embassies that want them, and we also send them to the British consul at New York. They have a commercial man, a commercial agent, practically, at New York, and we send them to him at his request. These representatives of the different countries call the attention, I presume, of some of the large concerns in their countries to the articles for which we are in the market to see whether or not they want to bid on them.

Senator TALIAFERRO. The purpose of this, then, is to get foreign bids?

Mr. Ross. Yes; if they want to bid. We do not advertise abroad, but a great many of the large concerns in Europe have agents in this country, just as a great many of the largest concerns in the United States have agents abroad, and we do get quite a great many bids on foreign materials; but they are made by American houses.

Senator TALIAFERRO. They are made on this side?

Mr. Ross. Yes, sir.

Senator MORGAN. Have you received any bids from abroad for steel rails manufactured in the United States?

Mr. Ross. No, sir.

Senator MORGAN. You have not?

Mr. Ross. No, sir; I have tried to purchase foreign rail a number of times before when I was with the Illinois Central, not so much because we expected to get a better price, but because we could not get as good a delivery as we wanted from the mills in this country. I made several efforts to get foreign rail, but they could not give any better delivery than we could get at home, and the price, on account of the duty, was considerably higher. I recently took the matter up with the agents in this country of about the largest steel-rail concern in Germany, and they said that their orders were so heavy that they could not promise delivery inside of three or four months at the shortest.

Senator TALIAFERRO. What do you mean by the duty making the foreign rails higher?

Mr. Ross. I was talking about the duty on rails coming into the United States at that time. Of course, there would be no duty on rail going to the Isthmus. I thought possibly we might get some competition on that last lot of rail from abroad, but I understand they are pretty well loaded up on orders over there. The Japanese Government and others have been buying a good deal of rail from Germany.

Senator TALIAFERRO. You say you do get bids from foreign houses on some of these articles, where the articles are manufactured in this country?

Mr. Ross. No, sir; I do not know of any cases of that kind.

Senator TALIAFERRO. I understood you to say that.

Mr. Ross. We get bids from a good many American concerns on material manufactured abroad, but we never get any bids from foreign concerns at all, direct. We never have received any bids made by parties abroad on any material manufactured abroad or manufactured here, either one.

Senator ANKENY. But you do get bids on foreign material from Americans concerns through American agencies?

Mr. Ross. Yes, sir. There are a great many of the large concerns in Germany and in England, too, that have agencies in New York, for instance, and have had for a great many years, and some of them have agencies in Chicago.

Senator TALIAFERRO. Can you not buy these articles abroad a great deal cheaper than you can get them in this country?

Mr. Ross. We do buy some things a good deal cheaper; yes, sir. I have a statement here showing the purchases we have made abroad so far. We have purchased altogether \$128,486 worth of material. That has consisted of some dredge buckets that could not have been purchased in any other place very well. They were buckets for dredges made in Scotland for the French Canal Company. I did get blue prints made and got competition here, but the prices that I obtained on them here were higher than we got from the people in Scotland who made the dredges.

Senator HOPKINS. That, I suppose, was due to the fact that that Scotch company had every facility for making them the same as they had made the others for the French company?

Mr. Ross. Yes, sir.

Senator HOPKINS. And the Americans had to—

Mr. Ross. They had to take it up as something new, as far as they were concerned. They would have to make special arrangements to make them. We also bought abroad some bar iron and some cast-iron pipe, pig lead, lead pipe, engineering instruments, and some cement. The last lot of cement was purchased abroad—20,000 barrels.

Senator MORGAN. Where did you buy that?

Mr. Ross. From the Wouldham Cement Company (Limited), at London.

Senator MORGAN. It was manufactured there, of course?

Mr. Ross. It was manufactured on the outskirts of London; yes. We got a great many bids on that cement, but the American concerns making Portland cement were all pretty well filled up with business. There has been so much building, so much railroad construction work, and so much general building that they have had about all the business they could handle.

Senator MORGAN. The demand for cement as a structural production is very rapidly increasing, is it not?

Mr. Ross. It is increasing more rapidly than the supply is increasing.

Senator MORGAN. Yes.

Mr. Ross. As I recall it, the last price we got on American cement, delivered on the Isthmus, was about \$2.30 or \$2.35 a barrel, and in purchasing it abroad we obtained a price of \$1.95 a barrel, delivered at Colon.

Senator DRYDEN. Was it equally as good as the American cement?

Mr. Ross. I looked into the subject pretty carefully before I made

the award. I had inquiries made as to how long the foreign manufacturers in question had been making cement, and in what countries their cement had been used. I found out that they had furnished a good deal of cement for use in Mexico, in a somewhat similar climate, and it had been very satisfactory, and their reputation was very good. Another thing that made me feel a little safer about it was that about that time the agent of the Associated Cement Manufacturers of Great Britain happened to be over here; he came in to see me about cement, and I told him that we had recently bought some abroad. He said that they were competitors of his, and he spoke very highly of them. I had that cement very carefully tested. Of course, we have it tested before it is shipped.

Senator HOPKINS. I was going to ask about those tests.

Mr. Ross. We get out our own specifications, of course, for cement, before we ask for bids, and our specifications are very much in detail as to the character of the cement and the tests that are to be made, and they all bid on the same specifications.

Senator KITTREDGE. You say "we get out the specifications." Who, in fact, gets them out?

Mr. Ross. The chief engineer.

Senator KITTREDGE. At the Isthmus?

Mr. Ross. Yes, sir.

Senator KITTREDGE. And he sends them to you?

Mr. Ross. Yes, sir; he sends them to us.

Senator DRYDEN. Were those tests made on the Isthmus after the cement arrived?

Mr. Ross. It is subjected to tests before it is shipped. The tests shown in the specifications are applied to it before it is shipped, and it passed those tests, and then when it got to the Isthmus, in order to make sure that it was all right, I asked the chief of the supply division down there to have the first shipment tested, and he reported that it had been carefully tested by the chief engineer and also by the superintendent of motive power, and that they reported that it was as good as any of the American cement they had received.

Senator DRYDEN. Have you heard that the cement deteriorated by reason of its having been brought so long a distance across the water through the effects of dampness?

Mr. Ross. No; I have not. We have received two or three shipments of this particular lot of cement now, and the reports on it have been first class. They reported that it was fully as good as the best quality of American cement they have so far received.

Senator DRYDEN. After it had arrived on the Isthmus?

Mr. Ross. Yes, sir. There is a great deal of foreign cement used in this country by railroads and others on account of the shortage in the supply and the high prices they have to pay to the American makers.

Senator HOPKINS. There was a time in this country when the foreign cement had the preference, was there not?

Mr. Ross. I think there was, a number of years ago, before they had much experience in making it here and—

Senator HOPKINS. Before the American cement demonstrated its quality?

Mr. Ross. Yes, sir.

Senator MORGAN. I want to ask the committee to summon Mr. Eckel, of the Geological Survey, before this body for the purpose of giving his statement in regard to Portland cement. Mr. Eckel is said to be, and I believe him to be, the most scientific man in America, and perhaps in the world, on this subject. He has recently published a book of five or six hundred pages, in which there are two or three hundred diagrams of different character, geological, topographical, and scientific, and of the machinery that is necessary for the production of Portland cement. My purpose in asking that he may be summoned is predicated upon his statements and those that Mr. Ross is now making and those that some others have already made here, and I wish to ask that a subcommittee of this body be raised to study the question as to whether the Government of the United States ought not to establish at some eligible point in the United States a manufactory of cement, and put it in charge of the very best scientists in the United States.

If the committee will indulge me just a moment on this matter, the recommendation of the President yesterday as to a lock canal evidently referred in terms of approbation and approval on his part and on the part, I suppose, of the gentlemen who comprise the majority that he spoke of in his message, of the dam at Gatun and the great lake system, raising the level of the canal to somewhere in the neighborhood of 80 or 85 feet. That structure at Gatun, or any structure at Bohio—I do not think that is possible, though—but at Gamboa will involve the necessity of purchasing millions and millions of barrels of cement. The structure, if made largely of concrete, evidently will be very much stronger than if built of cut stone, and is to be the final reliance of this entire project of building a lock canal on the Isthmus.

It is necessary, in order to have perfect strength throughout a structure as long as that and involving as many buttresses and all that as it will involve, that there should be uniformity in the cement that is used.

Senator KITTREDGE. What structure do you now refer to, Senator?

Senator MORGAN. I refer to the dam at Gatun. I take that for an illustration.

Senator KITTREDGE. They do not use any cement in that. They pile up a lot of earth.

Senator MORGAN. They need a cement core.

Senator KITTREDGE. No.

Senator MORGAN. I beg pardon.

Senator KITTREDGE. Well, they do not recommend it.

Senator MORGAN. Yes, they do; not throughout, but a cement core.

Senator KITTREDGE. They use cement in the locks——

Senator MORGAN. Yes; and in the locks.

Senator KITTREDGE. They use cement in the locks, but not in the dam.

Senator MORGAN. They will not get through with that dam, in my opinion, and it is only my opinion, without inserting in it a cement core through its whole extent. I think that will be found necessary.

Senator KITTREDGE. I think they will have to do more than that.

Senator MORGAN. I think they will find it necessary, and it is very much cheaper than stone of any description except mere riprap.

Senator HOPKINS. It is better than stone if it is good cement.

Senator MORGAN. Yes. The point I want to call attention to is the necessity of uniformity in two respects: First, uniformity in the supply. It must be on hand at the right time, and it must not be exposed, as was suggested here a moment ago, to the dampening that occurs in an oceanic voyage. The next and by far the more important proposition connected with the use of cement is the uniformity of its setting, the time within which it sets. Portland cement is Portland cement, made according to a chemical formula, but some Portland cement will set quicker than others, and they have, in the manufacture of that article, tests by which they determine the time within which it sets. For structures under water, and particularly sea water, it is very essential that the setting should take place not too rapidly and not too slowly. It should be uniform throughout the whole structure.

If the Government of the United States has a manufactory of Portland cement in any place for the purpose of supplying the needs of the canal they will be able to control almost absolutely the time of the setting of the cement. They will be able to control the supply so that it shall never be wanting, and so that the cement will not be too old when it is being used. Therefore the proposition that I have in view in these remarks is that when we have heard from Mr. Eckel we raise a subcommittee of this body to consider the question whether the Government of the United States ought not to go into the business of producing this cement, and not leave it to the scattered supply that we can get from various different concerns, of cement of different character, in order that we may secure uniformity in delivery and uniformity in the physical conditions which result from the setting, say, within one hour or thirty minutes or two hours, whatever the time may be that the engineers may determine is the best.

Mr. Stevens informed us the other day that he, as chief engineer of this canal, examined personally all the cement that he put into any work down there. He is an expert, and he knows these differences, and knows when it is a good cement, and where the fault is to be found. If he can devote his time to the examination of this question of cement, as a matter of absolute duty on his part, it is an admonition to us that we ought to devote time in conference with him, also, to the question of whether or not the Government should not establish its own cement works.

Senator HOPKINS. If you will permit me right there, I have no objection to hearing this expert, because of course his testimony will be valuable to us, but if we want to get uniformity in this Portland cement, of the character that you speak of, we can secure it from private concerns just as well as to establish a Government plant, on the same theory that we get the armor plate for our war vessels. In order to secure armor plate of the character that is described in the specifications, the Government sends an inspector right to the plant where it is being manufactured, and every step that is taken is under the supervision of a Government inspector; and that could be done in the case of the Portland cement.

Senator MORGAN. That is to say, the Government would send an inspector to every Portland cement factory?

Senator HOPKINS. No; you could do this: You could make an arrangement with some one concern. If it is known how many thousand barrels of Portland cement we want, bids could be secured to furnish the required quantity through a series of months or years, as the case may be. Then in the contract let it be provided that the Government inspector shall be present at the time that this is manufactured.

Senator MORGAN. You mean that arrangement could be made with one concern?

Senator HOPKINS. With one concern.

Senator MORGAN. An arrangement with one company for its production would be a contract by which we would take all of the supply and put them under the regulations of the Government in the manufacture.

Senator HOPKINS. Yes.

Senator MORGAN. The question would arise as to whether the Government would undertake that job on its own account, or whether it would let it out by contract?

Senator HOPKINS. Yes.

Senator MORGAN. That would be the question. Of course we would have our views about that and would have to determine which would be the best; but I think that the Government may possibly find it greatly to its advantage to control the production, and with that view I propose to have a subcommittee of this body charged with that special duty.

Senator HOPKINS. Yes.

Senator MORGAN. My proposition is to have this subcommittee charged with the special duty of looking into that subject and reporting the facts to this committee. It is a thing that need not be acted upon immediately at all. It is a question that may be considered a year hence or two years hence, even, before we commence actually using the cement; but in preparation for it I regard it as a very crucial matter that the vast quantity of cement that must necessarily be used there should be under the control of the authority of the Government by inspection or else by manufacture, so that this uniformity shall be secured.

I wish to make just this remark in regard to the steel plant that the Senator spoke of. We find that Bessemer steel is no more spoken about. It is not talked of at all for the purpose of making, for instance, ship armor and guns or even rails for railroads. The reason for that is this: That in every Bessemer plant the point of conversion into Bessemer steel is determined by the eye of the operator. A certain color appears in the flame, and he determines that that is its best state; that the carbon and the metal have been reduced to a certain point, not too low, not too high, and that makes a good product; but the open-hearth furnaces that operate on what is called the basic principle have brought the science of steel making to such perfection that they can make steel of uniform strength through thousands and hundreds of thousands and even millions of tons, and that is, after all, the reason why the basic steel is supplanting the Bessemer steel. It is the uniformity of production, the reliance that you can place upon every pound of steel that goes into the armor of any ship or into any gun or into any railroad rail. It

is the uniformity of strength, after all, that is the great desideratum. So it is with Portland cement. We have got to have the uniformity.

I merely make the suggestion, begging the pardon of the committee for delaying the committee about it, because the matter is one that I have thought over a good deal, and made several reports to the Senate about, and I think that you will find that this very point that I mention now is one that will require the most careful consideration and legislation on the part of this Government.

Senator DRYDEN. It is on the ground that the entire structure can not be any stronger than its weakest point?

Senator MORGAN. Yes.

Senator HOPKINS. I think there is much force in that.

Senator KITTREDGE. Have you any specifications, Mr. Ross, that have been prepared?

Mr. Ross. For cement?

Senator KITTREDGE. For cement.

Mr. Ross. Yes, sir; I have here a copy of our specifications.

Senator KITTREDGE. Will you leave them here?

Mr. Ross. Yes, sir.

Senator KITTREDGE. Have you specifications prepared upon which the purchase of locomotives has been made?

Mr. Ross. Yes, sir.

Senator KITTREDGE. Have you them here?

Mr. Ross. Yes, sir.

Senator KITTREDGE. Will you leave them here?

Mr. Ross. Yes, sir.

Senator KITTREDGE. And also in regard to steam shovels?

Mr. Ross. Yes, sir.

Senator KITTREDGE. Who made the specifications for the last order of locomotives?

Mr. Ross. They were prepared by or under the direction of Mr. Stevens.

Senator KITTREDGE. I would like to look at them.

Mr. Ross. Here they are [handing papers to Senator Kittredge].

Senator ANKENY. Coming back to this steel-rail question, you spoke of the difficulty of getting them when you wanted them. Is the weight, quality, etc., of the steel rails uniform? Do you buy steel rails of one weight?

Mr. Ross. Yes.

Senator ANKENY. Of what weight.

Mr. Ross. Seventy pounds to the yard. We had no difficulty in getting rail when we wanted it, on this last order. We got very prompt shipment on it.

Senator ANKENY. It was before that you had the trouble?

Mr. Ross. Yes, sir.

Senator TALIAFERRO. What did you pay?

Mr. Ross. \$26.45, delivered alongside the vessel at Baltimore.

Senator TALIAFERRO. What was the market price? What was the quotation?

Mr. Ross. The price generally charged the railroads is \$28 at the mill. These came from the Carnegie mill, and they had to pay the freight on them to Baltimore. This purchase was on an export basis. We purchased them through the United States Steel Products Export Company.

Senator MORGAN. They sold them on the basis of what they could get for them in the London or Liverpool market?

Mr. Ross. They put their price down, I presume, for the reason they figured that they might have foreign competition.

Senator TALIAFERRO. You got these rails at \$26.45?

Mr. Ross. Yes; delivered alongside the vessel at Baltimore.

Senator TALIAFERRO. As against \$28?

Mr. Ross. As against \$28, which is the usual charge to the railroads here this year.

Senator TALIAFERRO. At the mill?

Mr. Ross. Yes, sir.

Senator TALIAFERRO. Which shows, Mr. Ross, that these people sell these rails abroad how much cheaper than they sell them here?

Mr. Ross. Well, it is hard to tell.

Senator TALIAFERRO. You might figure that out and let us know to-morrow, when you come to take up the subject again.

Mr. Ross. It depends on the place of delivery, of course; but that shows that in this case they delivered the rails to us alongside the vessel at Baltimore at \$1.55 a ton less than they usually charge at the mill.

Senator TALIAFERRO. That is, they delivered it to you in Baltimore for foreign use?

Mr. Ross. Yes, sir.

Senator TALIAFERRO. At \$1.55 less than they charge for American use at the mill?

Mr. Ross. Yes, sir.

Senator TALIAFERRO. I will take up this question with you to-morrow.

(The committee thereupon, at 12 o'clock m., adjourned until to-morrow, Wednesday, February 21, 1906, at 10.30 o'clock a. m.)

(The following are the Isthmian Canal Commission's specifications for the Portland cement, steam shovels, and locomotives, requested by Senator Kittredge in the foregoing proceedings:)

ISTHMIAN CANAL COMMISSION.

Specifications for Portland cement.

1. The cement shall be Portland, dry and free from lumps.

By a Portland cement is meant the product obtained from the heating or calcining up to incipient fusion of intimate mixtures, either natural or artificial, of argillaceous with calcareous substances, the calcined product to contain at least 1.7 times as much of lime, by weight, as of the materials which give the lime its hydraulic properties, and to be finely pulverized after said calcination, and thereafter additions or substitutions for the purpose only of regulating certain properties of technical importance to be allowable to not exceeding 2 per cent of the calcined product.

2. The cement shall be put up in strong, sound barrels, well lined with damp-proof paper, so as to be thoroughly protected against moisture. Each package shall be plainly labeled with name of the brand and of the manufacturer. Any package broken or containing

damaged cement may be rejected or accepted as a fractional package.

3. Bidders shall state the brand of cement which they propose to furnish. The right is reserved to reject a tender for any brand which has not established itself as a high-grade Portland cement and has not for three years or more given satisfaction in use under climatic or other conditions of exposure of at least equal severity.

4. The average weight per barrel shall not be less than 375 pounds *net*. If the weight, as determined by test weighings, is found to be below 375 pounds per barrel, the cement may be rejected; or, at the option of the chief engineer, the contractor may be required to supply, free of cost to the United States, an additional amount of cement equal to the shortage.

5. Tests may be made of the fineness, specific gravity, soundness, chemical properties, time of setting, and tensile strength of the cement.

FINENESS.

6. Ninety-two per cent of the cement must pass through a sieve made of No. 40 wire, Stubb's gauge, having 10,000 openings per square inch.

SPECIFIC GRAVITY.

7. The specific gravity of the cement, as determined from a sample which has been carefully dried, shall be between 3.10 and 3.25.

SOUNDNESS.

8. To test the soundness of the cement, at least two pats of neat cement, as taken from the package, mixed for five minutes with about 20 per cent of water by weight, shall be made on glass, each pat about 3 inches in diameter and one-half inch thick at the center, tapering thence to a thin edge. The pats are to be kept under a wet cloth until finally set, when one is to be placed in fresh water for twenty-eight days. The second pat will be placed in water which will be raised to the boiling point for six hours, then allowed to cool. Neither should show distortion or cracks. The boiling test may or may not reject at the option of the engineer officer in charge.

CHEMICAL PROPERTIES.

9. Not more than three per cent, by weight, of magnesia, one and three-tenths per cent of sulphuric anhydride, or two per cent of sulphate of lime will be allowed.

TIME OF SETTING.

10. The cement shall not acquire its initial set in less than forty-five minutes, and must have acquired its final set in ten hours.

The pats made to test the soundness may be used in determining the time of setting. The cement is considered to have acquired its initial set when the pat will bear, without being appreciably indented, a wire one-twelfth inch in diameter, loaded to weigh one-fourth pound. The final set has been acquired when the pat will bear, without being appreciably indented, a wire one twenty-fourth inch in diameter, loaded to weigh one pound.

TENSILE STRENGTH.

11. Briquettes made of neat cement, after being kept in air for twenty-four hours, under a wet cloth, and the balance of the time in water, shall develop tensile strength per square inch, as follows:

After seven days, 450 pounds.

After twenty-eight days, 540 pounds.

Briquettes made of 1 part cement and 3 parts standard sand, by weight, shall develop tensile strength per square inch as follows:

After seven days, 140 pounds.

After twenty-eight days, 220 pounds.

In case quick-setting cement is desired, the following tensile strengths shall be substituted for the above:

NEAT BRIQUETTES.

After seven days, 400 pounds.

After twenty-eight days, 480 pounds.

Briquettes of 1 part cement to 3 parts standard sand:

After seven days, 120 pounds.

After twenty-eight days, 180 pounds.

12. The highest result from each set of briquettes made at any one time is to be considered the governing test. Any cement not showing an increase of strength in the twenty-day tests over the seven-day tests will be rejected.

13. When making briquettes, well-dried cement and sand will be used, neat cement will be mixed with 20 per cent of water by weight, and sand and cement with 12½ per cent of water by weight. After being thoroughly mixed and worked for five minutes the cement or mortar will be placed in the briquette mold in four equal layers, and each layer rammed and compressed by thirty blows of a soft brass or copper rammer three-quarters of an inch in diameter (or seven-tenths of an inch square, with rounded corners), weighing 1 pound. It is to be allowed to drop on the mixture from a height of about half an inch. When the ramming has been completed the surplus cement shall be struck off and the fine layer smoothed with a trowel held almost horizontal and drawn back with sufficient pressure to make its edge follow the surface of the mold.

14. The above are to be considered the minimum requirements. Bidders will be prepared to place at the disposal of the Commission a sample barrel of the cement which they propose to furnish under their bids if called upon to do so. If this sample shows higher tests than those given above the average of tests made on subsequent shipments must come to those found with the sample.

15. A cement may be rejected in case it fails to meet any of the above requirements. An agent of the contractor may be present at the making of the tests, or, in case of a failure of any of them, they may be repeated in his presence. All tests shall be made on samples taken by the Commission from cement actually delivered to it or its agent.

The foregoing specifications are general, but the right is reserved to call for quicker setting cement, in which case it shall not acquire its initial set in less than 20 or more than 30 minutes, and must have acquired its final set in not less than 45 minutes or more than 2½ hours.

The right is also reserved to call for cement adapted to salt water, in which case it shall not have more than 2 per cent, by weight, of magnesia, about $\frac{1}{2}$ per cent of sulphuric anhydride, or 1 per cent of sulphate of lime. There shall not be more than 25 per cent of the quicker setting cement or of the salt-water cement called for.

In all cement special care shall be taken with the packing, to meet tropical conditions.

General specifications for 70-ton steam shovels.

1. As each manufacturer of steam shovels has some specialty, these specifications are made general, to avoid limiting competition to shovels of any one make.

2. The weight of shovel should approximate very closely 70 tons, and must not be less than 65 tons or more than 75 tons in weight.

3. The capacity of dipper not to be less than 3 cubic yards.

4. Height from point of boom not less than 26 feet nor more than 30 feet.

5. Height of "A" frame not less than 17 feet or more than 20 feet, and should be arranged to lower to 16 feet.

6. Clear height of lift above rail between 15 and 20 feet, and reach below top of rail at least 8 feet.

7. Minimum width of cut at 8-foot elevation, 40 feet.

8. This shovel must be first-class in every particular, and fully up to standard specifications of similar shovels furnished by the bidder to previous purchasers.

9. No bids will be considered for any type of shovel which has not actually had service tests in stiff clays and heavy blasted rock work.

10. All bids must be accompanied by detailed drawings and manufacturers' standard specifications; also by a list of shovels of the same character furnished to other parties, together with a certified record of the work actually performed by them where the shovels have been used in materials specified above, signed and certified to by the purchaser or user of the shovel.

11. These shovels should have a loading capacity of from 2,000 to 3,000 cubic yards per day of ten hours in stiff clays and heavy blasted-rock work.

12. All bidders will be required to accept the responsibility for the shipment of the shovels to Culebra, Canal Zone; set them up, and furnish the necessary men to operate them successfully for two continuous weeks, during which time the shovels will be required to excavate and load 2,000 cubic yards, solid measurement, per day of ten hours for six consecutive days. These shovels will not be accepted or paid for by the Commission until this service test has been made to the satisfaction of the chief engineer.

13. The price offered shall cover delivery, c. i. f. on dock at Colon (Atlantic port) or La Boca (Pacific port), Canal Zone. The Commission will bear the cost of transportation from Colon or La Boca to Culebra. Such action shall not be construed or held to be a delivery or acceptance by the Commission at Colon or La Boca, but said act shall be considered as being done and performed for and on behalf of the steam shovel company.

14. All shovels will be subject to inspection as to quality of material and workmanship by duly authorized agent of the Commission at the

works of the manufacturer; but this inspection will in no way render the Commission liable for any payment on account thereof. Contractors will be held responsible for these shovels, and will receive no payment for same until after the efficiency test at Culebra.

15. The track gauge upon which these shovels are to be used is five feet, and wheel gauge of trucks must be arranged accordingly.

16. The car must be equipped with train air pipe.

17. Special attention is called to the proper housing of these shovels. Protection to all immediately working on the shovels must be provided for. This protection, however, should be as light and open at the sides as possible.

18. Easily adjustable side curtains of steel or other material must be provided, as the isthmian climate requires adequate ventilation and protection from both rain and sun.

19. The use of wood either in trucks, car body, frame, or shovel will not be permitted, and all parts, of whatever nature, of the complete machine must be of the best quality of steel or other acceptable metal.

20. Boilers to be of the locomotive type, and of as large capacity as the construction of type of shovel offered will permit, and equipped to burn bituminous coal of average quality.

Special consideration will be given to the shovel bid having boiler with the greatest steaming capacity.

21. The final determination of the selection of shovels will depend upon expert examination of the plans and specifications submitted by the manufacturer. The service record of the shovels and the reputation and ability of the manufacturer will receive due consideration.

22. The Commission, however, reserves the right to reject any or all bids, and to accept bids most advantageous to the Government.

23. Bidders will be required to furnish a list and submit a schedule of prices for all extra parts of these shovels, in order that they may be supplied as needed.

24. The successful bidder will be expected to furnish complete working prints of the detail parts entering into the construction of the shovel.

25. The first shovel must be completed and loaded on board cars, ready for shipment at the works of the manufacturer, within thirty (30) days after acceptance of bid; each succeeding shovel to be completed and loaded on board cars, ready for shipment at the point of manufacture, not later than fifteen (15) days thereafter, the last shovel to be ready for shipment not later than August 15, 1906.

ISTHMIAN CANAL COMMISSION.

Preliminary general specifications for a mogul freight locomotive for spotting and switching cars at shovels and dumps.

Type.—Mogul, with 6-wheeled tender having a sloping tank; coal capacity, 6 tons; water capacity, 4,000 gallons. To freely round a 20° curve. Fitted with pilot at both ends and fully equipped for running in either direction with safety.

Gauge.—Five feet 0 inches.

Fuel.—Bituminous coal.

Cylinders.—Diameter, 19 inches; stroke, 24 inches.

Driving wheels.—Diameter, 54 inches.

Weight on drivers.—About 108,000 pounds.

Weight on pony truck.—About 18,000 pounds.

Total weight.—About 126,000 pounds.

Total driving-wheel base.—About 13 feet 0 inches.

Total wheel base of engine.—About 20 feet 6 inches.

Boiler.—Extended wagon-top type; working steam pressure, 180 pounds; smallest diameter of boiler, 58 inches; length of fire box inside, 98 inches; width of fire box inside, 34 inches; water space front, 4 inches; water space back and sides, $3\frac{1}{2}$ inches.

Flues.—Outside diameter, 2 inches; length, about 11 feet 0 inches.

Tractive power.—22,030 pounds.

Hauling capacity.—1 per cent grade, including engine and tender, 920 tons; 1 per cent grade, excluding engine and tender, 828 tons.

General remarks.—As these locomotives will be engaged in hauling excavated material, all attachments, such as cross brake beams, cylinder cocks, ash pans, etc., should be arranged for as much clearance above the rail as possible, approximating 12-inch clearance if it can be so arranged.

The tender frames should be at least 26 feet long, in order to keep center of gravity of sloping tank as low as possible, as well as to reduce obstructions to vision to as low a minimum as possible when coupling up or in backing up.

To be fully equipped with air brakes on engine and tender with outside equalized driver brakes.

To be fully equipped with the necessary safety appliances to fully meet the requirements of the interstate law.

Full detail erecting prints and specifications to be furnished with proposals submitted.

ISTHMIAN CANAL COMMISSION.

Preliminary general specifications for a mogul freight locomotive for road service.

Type.—Mogul, with 8-wheeled tender having a sloping tank; coal capacity, 6 tons; water capacity, 4,000 gallons. To freely round a 20° curve. Fitted with pilot at both ends and fully equipped for running in either direction with safety.

Gauge.—5 feet 0 inches.

Fuel.—Bituminous coal.

Cylinders.—Diameter, 20 inches; stroke, 26 inches.

Driving wheels.—Diameter, 63 inches.

Weight on drivers.—About 120,000 pounds.

Weight on pony truck.—About 20,000 pounds.

Total weight.—About 140,000 pounds.

Total driving-wheel base.—About 14 feet 6 inches.

Total wheel base of engine.—About 22 feet 6 inches.

Boiler.—Extended wagon-top type; working steam pressure, 180 pounds; smallest diameter of boiler, 64 inches; length of fire box

inside, 108 inches; width of fire box inside, 40 inches; water space, front, 4 inches; water space, back and sides, $3\frac{1}{2}$ inches.

Flues.—Outside diameter, 2 inches; length, about 12 feet 3 inches.

Tractive power.—About 25,260 pounds.

Hauling capacity.—1 per cent grade, including engine and tender, about 1,052 tons; 1 per cent grade, excluding engine and tender, about 945 tons.

General remarks.—As these locomotives will be engaged in hauling excavated material, all attachments such as cross brake beams, cylinder cocks, ash pans, etc., should be arranged for as much clearance above the rail as possible, approximating 12-inch clearance if it can be so arranged.

The tender frames should be at least 26 feet long, in order to keep center of gravity of sloping tank as low as possible, as well as to reduce obstructions to vision to as low a minimum as possible when coupling up or in backing up.

To be fully equipped with air brakes on engine and tender, with outside equalized driver brakes.

To be equipped with the necessary safety appliances to fully meet the requirements of the interstate law.

Full detail erecting prints and specifications to be furnished with proposals submitted.

ISTHMIAN CANAL.

COMMITTEE ON INTEROCEANIC CANALS,
UNITED STATES SENATE,
Washington, D. C., Thursday, February 22, 1906.

The committee met at 10.30 o'clock a. m.

Present: Senators Millard (chairman), Kittredge, Dryden, Hopkins, Ankeny, Morgan, Taliaferro, and Simmons.

TESTIMONY OF DAVID W. ROSS, ESQ.—Continued.

The CHAIRMAN. Senator Taliaferro, I believe you were asking Mr. Ross some questions at the time of adjournment.

Senator TALIAFERRO. Yes. You said, Mr. Ross, when you were last here, that you would prepare some figures showing the difference in the charge for rails for American use and for foreign use. Did you prepare those?

Mr. Ross. Of course I do not know what they charge other people. The only information I have is as to the prices they have quoted us. They did quote us at one time a price of \$1 lower than this; that is, \$25.45 instead of \$26.45; and I presume the prices they quote to others depend largely on the quantity and the amount of competition they expect. In this case, you see, they charged us \$26.45 delivered at Baltimore, which is \$1.55 less than they are presumed to charge at the mill, although I think in some cases that they do, to roads whose tracks do not reach any of their mills, allow some freight. In some cases I am quite sure that they do. But their standard price of \$28 is presumed to be the price at the mill. I suppose they make their quotations to foreign concerns as low as they think is necessary to get the business. It depends largely on the quotations being made by foreign rail makers, and they are pretty well posted about it all the time through getting into competition with them.

Senator TALIAFERRO. Did these people from whom you bought know where these rails were to be used?

Mr. Ross. Yes, sir.

Senator TALIAFERRO. It was understood between you, then, that these rails were for foreign use, to be used outside of the country?

Mr. Ross. Yes, sir. I asked them for quotations on the rails delivered on the Isthmus and for another quotation delivered at a seaport in the United States. I did not specify any particular seaport, because one company might make delivery at one seaport and another one at another seaport, so that I just got quotations for delivery at the Isthmus and for delivery at a seaport in the United States.

Senator TALIAFERRO. For use on the Isthmus?

Mr. Ross. Yes, sir.

Senator TALIAFERRO. Was that specified?

Mr. Ross. That was understood. I knew when I was in the railroad business, of course, that they made lower prices for foreign use, or for use abroad, than they made to the railroads in this country, and I think nearly all of the railroads in this country understand that. I have talked with railroad people about it, and have heard them state that they were glad to have the mills in this country get the outside business, even though they could not get as low a price on the rail themselves as the mills made for foreign use, for the reason that it brought that much additional money into this country and helped to keep the balance of trade in our favor. Of course all the business we can get outside of our own country helps us a great deal by bringing that much additional money into the country, by giving that much additional business to our manufacturing industries and additional tonnage to the railroads, which they would not get if our industries did not get such foreign business. I think the railroads look at it in that broad way and do not object to it very much on that account.

Senator TALIAFERRO. You mean they do not object to paying more for the rails than the foreigner has to pay because it throws the balance of trade in our favor?

Mr. Ross. They do not object to paying more for rail than the same rail mills sell for to foreigners, because it brings the money into the country and helps to keep the balance of trade in our favor, which is a good thing for the country at large and for the railroads themselves.

Senator TALIAFERRO. In other words, you think they would be willing to pay \$2.50 or \$3 a ton more for rails in order to throw the balance of trade in our favor?

Mr. Ross. Yes, sir; I think as a general rule that is so.

Senator TALIAFERRO. That is very unselfish of them.

Mr. Ross. They are all well acquainted with the fact that the rail mills in this country have made lower quotations abroad than they do here, and the rail mills in the other countries—not only the rail mills, but all sorts of manufacturing concerns in other countries—make lower prices outside of their countries than they do to the consumers in their countries.

I read an article not long ago in the Iron Age, which is looked up to as being the standard paper in iron and steel circles, showing that the mills in Europe were making lower quotations for foreign business than they were for their home consumption.

Senator TALIAFERRO. Let us test that by your experience, Mr. Ross. You have been buying a great deal for this canal and for the Panama Railroad Company. Have you found that report, which you say you read in the Iron Age, to be borne out by the facts? Do foreign countries offer to sell you material for the construction of this work on the Isthmus at a lower price than they sell to their own people?

Mr. Ross. I could not say about that, because I do not know exactly what prices they are making their own people. I just mentioned that as a matter of information that I had gotten. The Iron Age is usually quite accurate.

Senator TALIAFERRO. You stated it as a fact.

Mr. Ross. No; I stated it as having seen it in the Iron Age.

Senator TALIAFERRO. You said it was a well-known fact, and that you had seen it in the Iron Age, as I understood you.

Mr. Ross. If I did, I would qualify it by saying that I got my information, as a rule, from the Iron Age. I have seen articles to that effect before.

Senator TALIAFERRO. As a matter of fact, have these foreign manufacturers bid on material for this work on the Isthmus?

Mr. Ross. Yes; we have had a good many bids, not through foreign houses direct, but through their agents in this country. We are having such bids on material all the time.

Senator TALIAFERRO. And they did not offer to undersell this market?

Mr. Ross. Yes, sir; on the opening the other day quite a number of the lowest bids were on foreign material—bar iron and material of that kind.

Senator TALIAFERRO. Do you expect to place orders with those bidders?

Mr. Ross. Yes, sir; whenever their price is the lowest and their delivery is satisfactory. We would make no discrimination against them.

Senator TALIAFERRO. You stated, Mr. Ross, that it was well known among the railroad companies that the rail mills had a lower price or put a lower price on their rails for foreign consumption than for American consumption.

Mr. Ross. Yes, sir.

Senator TALIAFERRO. That is the rule with the mills, as you understand it?

Mr. Ross. Well, I do not know whether it is the rule or not, but I know that they have in a good many cases, and that it has been well known by the railroads in this country that they are paying higher prices than the same mills sometimes make on rail for foreign use.

Senator TALIAFERRO. Do you know about what the difference is?

Mr. Ross. I do not know definitely, any more than what I have said in connection with our own rail, of course.

Senator TALIAFERRO. Have you inquired what the freight is from this particular mill where you bought this rail to Baltimore?

Mr. Ross. No, sir; I have not. They do not usually pay any more freight than they have to, and I imagine it would be about 75 or 80 cents a ton, probably. So that I should say that that price would be equal to about \$25.60 or \$25.65 at the mill; probably about \$25.65.

Senator TALIAFERRO. The regular price at the mill is what for American use?

Mr. Ross. It is supposed to be \$28.

Senator TALIAFERRO. Then the price you paid would be \$25.65 against \$28?

Mr. Ross. Yes, sir; approximately so.

Senator KITTREDGE. I asked you at the last session, Mr. Ross, if you had with you specifications for locomotives.

Mr. Ross. Yes, sir; they were printed in the record.

Senator KITTREDGE. They are printed in the record which is before us this morning?

Mr. Ross. Yes, sir; they are in the copy of my testimony of the other day. The specifications for the cement and the steam shovels and the locomotives that you asked me about are all printed in this record of my testimony.

Senator KITTREDGE. What other materials in large quantities have you purchased since you became connected with the Commission?

Mr. Ross. Oh, we have purchased flat cars and great quantities of lumber, of course.

Senator KITTREDGE. When were the flat cars purchased?

Mr. Ross. The flat cars were purchased in October.

Senator KITTREDGE. Of last year?

Mr. Ross. Yes, sir.

Senator KITTREDGE. Who prepared the specifications for them?

Mr. Ross. Mr. Stevens.

Senator KITTREDGE. Have you those specifications here?

Mr. Ross. Yes, sir; I have them here.

Senator KITTREDGE. Have they been put into the record?

Mr. Ross. No, sir.

Senator KITTREDGE. I would like to have you leave them here, so that they can go into the record if it is desired.

Mr. Ross. Very well, sir.

Senator KITTREDGE. State, in a general way, the character of the flat cars that you purchased.

Mr. Ross. They are what might be called standard 40-ton wooden flat cars, the last lot.

Senator KITTREDGE. In what manner do they propose to dump the material?

Mr. Ross. From these flat cars?

Senator KITTREDGE. Yes.

Mr. Ross. They are going to use Lidgerwood unloaders and ballast plows—side and center ballast plows.

Senator KITTREDGE. Explain what they are.

Mr. Ross. They are very commonly used by railroads and by contractors. A Lidgerwood unloader is practically the same as a hoisting engine, with a drum connected with a cable which pulls these plows right along a string of flat cars and shoves the dirt off, either on both sides or on one side, according to which way they want it dumped. Mr. Stevens, when he first went to the Isthmus, or shortly after he first went to the Isthmus, on account of the sticky nature of the soil and the material that was being gotten out at that time, came to the conclusion that flat cars with Lidgerwood unloaders and ballast plows would probably dump the material, some of the material, at least, better than the dump cars, and it was on that account that he made the requisition for these 800 flat cars. Of course they can be used for any purpose. They are just the standard 40-ton flat car, similar to those that you see on the railroads all over the country.

Senator KITTREDGE. I suppose at the unloading place they construct a trestle or bridge onto which they run these flat cars and then unload them?

Mr. Ross. They may probably do so in some cases; yes, sir.

Senator KITTREDGE. Will it not be necessary, in order to use these unloaders or flat cars with the unloaders, to have that sort of a structure?

Mr. Ross. It will not be necessary to have that sort of a structure any more than it would be with the dump cars. They can use them in almost any place where they could use the dump cars.

Senator KITTREDGE. What is the character of the structure that will be necessary in order to use these flat cars?

Mr. Ross. In a great many, in fact nearly all, cases it will not be necessary to have any structure at all. Such a structure would be needed as much in connection with the use of dump cars as with flat cars.

Senator KITTREDGE. Where it is necessary to have a structure, what will be the nature of it?

Mr. Ross. They will build a trestle.

Senator KITTREDGE. And what is the character of the trestle?

Mr. Ross. Just wooden frame bents and ties.

Senator KITTREDGE. Will it not be necessary to construct a very substantial structure?

Mr. Ross. No, sir.

Senator KITTREDGE. Is not the weight of the car and the strain upon the trestle heavy where you use this sort of a flat car and plow?

Mr. Ross. No, sir; not particularly so. A flat car and plow would not be as heavy, combined, as the locomotive that would have to handle them anyway. They are used very commonly all over the country by contractors and others. There are a great many more of them in use than there are dump cars.

Senator KITTREDGE. You say that a trestle will not be necessary in the ordinary conditions?

Mr. Ross. I do not think that a trestle will be used in very many cases.

Senator KITTREDGE. On account of the character of the land?

Mr. Ross. On account of the character of the land they will probably be able to dump a great part of it without the use of a trestle. They can dump anywhere from these flat cars that they could from dump cars.

Senator KITTREDGE. The point that I am getting at is whether, in the use of this peculiar kind of dump car, you will not be compelled to have a stronger structure than you would with the other kind of dump cars?

Mr. Ross. No, sir; it makes no difference in that respect.

Senator KITTREDGE. Where are these dump cars of the character you have described manufactured?

Mr. Ross. These are not dump cars that I have been talking about.

Senator KITTREDGE. I mean flat cars.

Mr. Ross. They are being built by the American Car and Foundry Company.

Senator KITTREDGE. Is that the only company that manufactures them?

Mr. Ross. No, sir; anybody making cars can make these flat cars. They are the simplest car, I suppose, that there is to make. A great many railroads build them.

Senator KITTREDGE. I understand about the flat car; but I mean the flat car with the attachment for dumping.

Mr. Ross. There is no attachment. That is entirely separate. We just buy the number of Lidgerwood unloaders and plows actually needed, as nearly all the railroads do. These ballast plows can be used on any flat cars. We do not have to have one for each car.

Senator KITTREDGE. Is there more than one plant in the country manufacturing these plows?

Mr. Ross. Well, as a matter of fact, I do not think there is.

Senator KITTREDGE. Where are they manufactured?

Mr. Ross. The Marion Steam Shovel Company makes them.

Senator KITTREDGE. Of Marion, Ind.?

Mr. Ross. Marion, Ohio. There are other people contemplating going into the business, I believe.

Senator KITTREDGE. How many bids did you in fact receive for this style of material?

Mr. Ross. For those ballast plows?

Senator KITTREDGE. Yes.

Mr. Ross. We only received one.

Senator KITTREDGE. And from this company?

Mr. Ross. Yes, sir.

Senator KITTREDGE. Did you advertise?

Mr. Ross. Yes, sir; we advertised all over the United States.

Senator KITTREDGE. And that was the only company that was manufacturing them at that time?

Mr. Ross. Yes, sir.

Senator KITTREDGE. Do you know whether there is any other concern that has gone into the business since?

Mr. Ross. No; but the Bucyrus people told me they might arrange to build them. There is nothing patented about it, and it is a simple thing to make. The demand for them has not been very great, because the railroads do not have to have very many of them. We do not need very many of them.

Senator KITTREDGE. You have one attached to each train, do you not?

Mr. Ross. Yes, sir; we will have one attached to each train they are used on.

Senator KITTREDGE. How many trains do you expect to have in use after the work actively begins?

Mr. Ross. I do not know how many trains they will have in use with flat cars. As I recall it, we bought a total of about twelve of those ballast plows. So far Mr. Stevens has not asked for any more.

Senator KITTREDGE. Have you any knowledge of how many will be required when the work is actively prosecuted?

Mr. Ross. No, sir; I have not heard anything from him on that.

Senator KITTREDGE. What is the cost of one of those implements?

Mr. Ross. I think about \$775 each, or something like that.

Senator KITTREDGE. In what manner did you advertise for the last order of locomotives?

Mr. Ross. We advertised in the Chicago and New York papers for them. There was not very much necessity for advertising. It was largely a formal matter in advertising for bids on those locomotives.

Senator KITTREDGE. Why was there not any necessity of the character you mention?

Mr. Ross. Well, there was a necessity, of course. We advertised for them because it was a large item and it was necessary to do so to comply with the regulations.

Senator KITTREDGE. What did that item amount to?

Mr. Ross. It amounted to about \$1,300,000.

Senator KITTREDGE. In what papers did you advertise?

Mr. Ross. It is shown in the statement I left the other day. I think in the New York Tribune, as I recollect it, or the Herald.

Senator KITTREDGE. In what other papers did you advertise?

Mr. Ross. The Chicago Tribune.

Senator KITTREDGE. And in any other town?

Mr. Ross. No, sir.

Senator KITTREDGE. Just in Chicago and New York?

Mr. Ross. Yes, sir; I had already been in communication, and was at that time in correspondence with all the people that were likely to bid on these locomotives, so that they did not depend on seeing the advertisements in the newspapers at all.

Senator KITTREDGE. You advertised, then, in two newspapers?

Mr. Ross. Yes, sir.

Senator KITTREDGE. And you had correspondence with other concerns manufacturing locomotives?

Mr. Ross. I had correspondence with all the concerns that do manufacture standard locomotives; yes.

Senator KITTREDGE. What concerns did you have correspondence with?

Mr. Ross. With the American Locomotive Company, the Baldwin Locomotive Works, the Rogers Locomotive Works, and the Lima Locomotive and Machine Company. I wrote them and called their attention to our advertisement.

Senator KITTREDGE. What is the date of that letter?

Mr. Ross. I have it here. It is September 12, 1905.

Senator KITTREDGE. What date did you advertise for the locomotives?

Mr. Ross. I think on the same day.

Senator KITTREDGE. When was the contract closed?

Mr. Ross. September 19.

Senator KITTREDGE. Show me the letter that you wrote to the Lima people.

Mr. Ross. Yes, sir. I wrote to their agents in New York. I knew who were their agents [handing letter to Senator Kittredge].

Senator KITTREDGE. I will ask you to put that in the record.

Mr. Ross. Yes, sir.

WASHINGTON, September 12, 1905.

DEAR SIRS: Referring to your letter of recent date concerning your desire to bid on locomotives, I send you herewith inquiry calling for bids on 120 locomotives, bids to be opened on 19th instant. I send these to you thinking that you may not have noticed our newspaper advertisement calling for these bids.

Yours, truly,

D. W. Ross,
General Purchasing Officer.

MOTLEY, GREEN & Co.,
Agents Lima Locomotive and Machine Company,
66 Broad Street, New York City.

Senator KITTREDGE. You did not advertise thirty days for the locomotives, then?

Mr. Ross. No, sir.

Senator KITTREDGE. Why not?

Mr. Ross. Well, for the reason that we wanted the delivery to commence at an early date and in order to get the delivery wanted it was necessary to get the order placed promptly, and also for the reason that the names of the concerns who can build standard locomotives are very well known to all people who use locomotives in this country. You see, the American Locomotive Company a few years ago—it is

five or six or seven years ago now—was organized and took in nearly all the concerns making standard locomotives, except the Baldwin Locomotive Works. They took in the Manchester Locomotive Works, in New Hampshire, I think it is, and the Pittsburg Locomotive Works, at Pittsburg; the Brooks Locomotive Works, at Dunkirk; the Schenectady Locomotive Works, at Schenectady; the Cook Locomotive Works, at Paterson, N. J.; the Richmond Locomotive Works, at Richmond, and when they got through the Baldwin Locomotive Works was practically the only one left outside.

Senator KITTREDGE. It was not the only company outside of the combination, was it?

Mr. Ross. It was the only company outside of the American Locomotive Company that built standard locomotives for railroads; yes, sir.

Senator KITTREDGE. You spoke of the Lima, Ohio, concern. Were they not manufacturing standard locomotives?

Mr. Ross. I do not understand they have been making locomotives that could be called standard locomotives; no, sir. The locomotives on which they bid were of a special type of their own.

Senator KITTREDGE. What is the character of their engines?

Mr. Ross. They build an engine designed, I think, particularly for heavy grades, sharp curves, and work like that—a Shay geared locomotive, they call it.

Senator KITTREDGE. In what respect do they differ from the ordinary locomotive for use in work such as you desire them for at the Isthmus?

Mr. Ross. The locomotives that we use at the Isthmus are for road service as well as for switching service. These locomotives are of quite a different type. I think some of them have been used on the Chesapeake and Ohio Railroad. I think they have a few for use where they have heavy grades, and I believe it is stated that the Denver and Rio Grande have some in use where they have heavy grades. They are particularly designed for that kind of work; but I understand they do not go into competition with the American Locomotive Works or the Baldwin Locomotive Works for standard road engines.

Senator KITTREDGE. As I understand, the use you have for locomotives at the Isthmus is not for ordinary road engines, necessarily, is it?

Mr. Ross. Yes, sir; they have to perform ordinary road service, too. The grades on the Isthmus as a rule are not very heavy or stiff.

Senator KITTREDGE. What is the average distance that you expect to run these locomotives, from the cut, for instance, to the dump?

Mr. Ross. They will be used, probably, all over the Isthmus, indiscriminately. The dirt trains will be run about 15 miles, I suppose; but all of those engines we bought will be used from one end of the Isthmus to the other.

Senator KITTREDGE. Well, that is only—

Mr. Ross. That is about 50 miles; it is 47 miles from Colon to Panama, and there is about 3 miles besides, a branch from a point near Panama to La Boca.

Senator KITTREDGE. Why did you desire the ordinary road locomotives instead of the type of the character you suggested, that is manufactured at Lima?

Mr. Ross. Mr. Stevens prepared the specifications, and if you will look at those specifications you will note they are about as open as they could possibly be.

Senator KITTREDGE. I understand you to say that you desired the ordinary road locomotives, rather than engines of the type manufactured by the Lima, Ohio, people?

Mr. Ross. Mr. Stevens got up the specifications, and he probably gave the matter very careful thought. I suppose 95 per cent of the locomotives in use on the railroads in the United States are on the same general lines as those specifications prepared by Mr. Stevens.

Senator KITTREDGE (returning to the letter). That is addressed to some gentleman in New York?

Mr. Ross. They are New York agents of the Lima Locomotive and Machine Company.

Senator KITTREDGE. And it is dated September 12?

Mr. Ross. Yes, sir.

Senator KITTREDGE. And the bids were opened on the 19th?

Mr. Ross. Yes, sir.

Senator KITTREDGE. Did you hear anything from those people after the 12th?

Mr. Ross. I do not recollect whether I did or not.

Senator KITTREDGE. Will you look and see?

Mr. Ross. Yes, sir. [After referring to files.] There is a letter dated September 14 from the same concern.

Senator KITTREDGE. Was that from the New York office?

Mr. Ross. Yes, sir. They say [reading]:

MOTLEY, GREEN & Co.,
New York, September 14, 1905.

DEAR SIR: We duly received your telegram of to-day's date and have instructed our works to prepare figures for the alternative bid requested by you, which we will arrange to have in your hands at the time set for the opening.

We note further from your telegram that our bid is to be made in letter form, in triplicate, and that no special form is required; also that no bond is required; all of which has our careful attention.

Thanking you for the consideration shown in the matter and trusting that our bid may prove to be satisfactory, we are,

Yours, respectfully,

MOTLEY, GREEN & Co.,
J. M. MOTLEY, President.

Mr. D. W. Ross,
General Purchasing Officer,
Isthmian Canal Commission, Washington, D. C.

Senator KITTREDGE. Do you understand that from the specifications you presented here it was possible for that company to bid?

Mr. Ross. Yes, sir; if they wanted to bid on those specifications. Anybody that wanted to build locomotives on those specifications could build them.

Senator KITTREDGE. Do you understand that it was possible under those specifications for the Lima, Ohio, engines to be accepted?

Mr. Ross. If they built engines in accordance with those specifications they would be accepted; but it was not possible for us to accept locomotives built as their Shay geared engines were to be built, because they did not follow our specifications. They stated in a letter attached to their bid that the locomotives on which they bid differed in type from those asked for in our specifications.

Senator KITTREDGE. Are you able to tell us the difference between the engines that they manufacture and the ordinary road engine?

Mr. Ross. Yes, sir; I can show you the difference from their specifications.

Senator KITTREDGE. Can you not state it so that it will go into the record?

Mr. Ross. I could make up a short statement that will show the difference.

Senator KITTREDGE. Can you not state what it is, for the use of the committee?

Mr. Ross. Well, their engine is a geared engine, designed specially, as I understand it, for use on heavy grades and on sharp curves.

Senator KITTREDGE. What do you mean by a geared engine? So that it can go into the record.

Mr. Ross. I do not think I could explain it any other way as well as I could by showing you their blueprints and reading their specifications. Their engine is not built on the same lines as the locomotives in general use on railroads nor in accordance with our specifications.

Senator KITTREDGE. Describe what you mean by a standard engine.

Mr. Ross. Our specifications are drawn on the same lines as nearly all of the engines in use by standard railroads.

Senator KITTREDGE. I understand; but what are they?

Mr. Ross. Our specifications simply show the type, the diameter and stroke of the cylinders, the diameter of the driving wheels, the diameter and other dimensions of the boiler and flues, the weight on the drivers, the weight on the pony truck, the wheel base, the tractive power, hauling capacity, and a few general matters of that kind, without going into specifications for materials at all.

Senator KITTREDGE. The materials would be substantially the same, no matter what the type of engine was, would they not?

Mr. Ross. No, sir; they might be very different.

Senator KITTREDGE. In what respect would they be different?

Mr. Ross. One might use case iron where another would use steel castings, for instance.

Senator KITTREDGE. Do your specifications define in that regard?

Mr. Ross. No, sir; they do not. We asked the bidders, as you will note in those specifications, to submit their own detailed specifications with their bid. Our specifications were just general specifications, showing what type, weight, and capacity of engines we wanted, and the bidders were invited to submit their own detailed specifications.

Senator KITTREDGE. For what purpose, then, were the specifications that you prepared submitted?

Mr. Ross. Largely to show the type, weight, and capacity of engine that we wanted.

Senator KITTREDGE. Did each one of the bidders for these locomotives submit specifications of their own?

Mr. Ross. Yes, sir; but their general specifications in each case conformed to ours, with the exception of the Lima Locomotive and Machine Company.

Senator KITTREDGE. Describe this locomotive manufactured by the Lima company.

Mr. Ross. As they said, the locomotives they offered differed in type from the one called for. I have not gone through their specifications well enough to describe it fully.

Senator KITTREDGE. Have you them here?

Mr. Ross. Yes, sir.

Senator KITTREDGE. Look at them, please.

Mr. Ross. They bid on 100 shay-geared locomotives.

Senator KITTREDGE. Can you not explain just what the shay-geared locomotive is?

Mr. Ross. They say in their general description: "Cylinders 12 inches in diameter by 15 inches stroke," while on this same lot of engines our specifications called for 19 by 24 inches. "Geared with pinions having 19 teeth and gear rims 42 teeth; 12 driving wheels," while our specifications called for 6. "Driving wheels 36 inches in diameter." The diameter of the driving wheels in our specifications is stated as 54 inches. The total wheel base of the engine in our specifications is shown as 20 feet 6 inches. They show their total wheel base as 42 feet 11 inches.

Senator KITTREDGE. I do not understand what you mean, Mr. Ross, by stating that you had an open specification.

Mr. Ross. Mr. Stevens prepared them as he did just for the purpose of making the competition as open as he possibly could. Railroads, in addition to giving the specifications that we gave, generally state whose make of tires they want to use—not the kind, but the actual make of tires, and the actual make of nearly all of the specialties or parts used on the engines. They show whose make of axles, whose make of journal bearings, whose make of tires, whose make of headlights, and as to many other parts of the engines they show just whose make they want used. But Mr. Stevens, in his desire to make the specifications as open as possible, left out all of those details, and only gave the general description of the engines he wanted, so as to indicate the weight and capacity of engine, largely, and the general type of engine, asking that the bidders be requested to submit their own detailed specifications showing exactly what they proposed to use in each case.

Senator KITTREDGE. What was the price of the Lima engines as compared with the engines you accepted?

Mr. Ross. Their bid was a trifle lower, as I recall it. I have the figures here. If they were awarded 100 locomotives, their bid was \$9,850.50, and we paid \$11,100.

Senator KITTREDGE. A difference of \$1,200 an engine?

Mr. Ross. Yes, sir; \$1,200 an engine. If they were awarded 75 locomotives their price was \$10,050.50, and if they were awarded 50 locomotives their price was \$10,250.50. Their prices were increased as the number grew smaller.

Senator KITTREDGE. That is usual, is it?

Mr. Ross. No, sir; it is not usual; but I do not think they expected to get all of them. They wanted to protect themselves in that way. They did not want to put in that price for the whole lot and then have us give them a small number of them. On the basis of their furnishing 25 locomotives their price was \$10,450.50.

Senator KITTREDGE. How many other bids were in fact received?

Mr. Ross. There were two other bids received, one from the American Locomotive Company and one from the Baldwin Locomotive Works. The bids from those three companies were all we had any idea of receiving, because there are no other companies that made any inquiries or that usually build such engines.

Senator KITTREDGE. Is the Baldwin Company a member of this trust? I have forgotten.

Mr. Ross. No, sir; it is entirely independent of the American Locomotive Company. It is a very large concern, and has an output almost as large, I suppose half or two-thirds as large as all the works belonging to the American Locomotive Company put together.

Senator KITTREDGE. How did their bids compare with those of the American Locomotive Company?

Mr. Ross. They were higher than the American Locomotive Company's bid. I have the abstract here showing that. On the 100 19 by 24 inch engines, where the American Locomotive Works bid \$11,100, the Baldwin Locomotive Works bid \$12,000; that is, their bid was \$900 higher. On the 20 by 26 inch cylinder locomotives, where the American Locomotive Works bid \$11,600, the Baldwin Locomotive Works bid \$12,750. I gave you the prices of the Lima engines.

Senator KITTREDGE. Yes.

Mr. Ross. They only bid on the smaller engines. I might say, in that connection, that on the day of the opening of those bids, the Lima Locomotive Works stated, in putting in their bid, that it was not in accordance with our specifications; but they were anxious to have the matter placed before Mr. Stevens, and they talked with Mr. Shonts about it; and Mr. Shonts, at their request, sent a cablegram to Mr. Stevens; I think I have a copy of it here. He wired Mr. Stevens as follows:

NEW YORK, September 19, 1905.

ISTHMIAN, Panama:

Lima Locomotive Company, responsible parties, submit lowest bid for 100 switching locomotives, offering Shay geared locomotive, guaranteeing under bond performance of all your requirements with the addition of saving 10 per cent fuel. They claim used with success on Chesapeake Ohio, Denver Rio Grande, Canadian Pacific, and many other standard roads. About 1,500 in use. Do you desire to try? If so, how many? Reply, New York.

SHONTS.

PANAMA, September 21, 1905.

SHONTS, New York:

Shay locomotives not adapted to our wants. Do not desire any of them.

STEVENS.

Mr. Stevens told me, when he was up here recently, that they also sent a representative down to the Isthmus afterwards to talk with him about it, and he went over the matter fully with him, but was still firmly of the opinion that their engine was not suitable for the requirements down there.

Senator KITTREDGE. The specifications that you drew, or that were drawn——

Mr. Ross. Mr. Stevens drew them.

Senator KITTREDGE. Those specifications would not admit of the Lima, Ohio, engine being furnished?

Mr. Ross. No, sir.

Senator KITTREDGE. But they would admit of the standard road engine being furnished?

Mr. Ross. Nearly all of the railroads, all, in fact, get up their own general specifications, and the American Locomotive Works and the Baldwin Locomotive Works build the engines in accordance with the specifications gotten up by the railroads. I do not think either the American or the Baldwin works have any special type of engine

of their own, as is the case with the Lima people. They have a type of engine of their own that they want to sell instead of building engines in accordance with the specifications of the railroads as the other companies named do. You see the difference that I am trying to make, sir?

Senator KITTREDGE. Do you know the price of the locomotives that you purchased as compared with those which these companies sold the railway companies last fall?

Mr. Ross. Well, I think it was low. I also obtained a bid, not at the time, but later, from one of the largest locomotive works in Germany. They did not put it in with the idea of trying to get any of these locomotives, but with the idea of showing us what they could do, and I have their price here. Their price on these locomotives that we bought for \$11,100 was \$17,270, delivered at Colon.

Senator KITTREDGE. I am speaking about the price which the Commission paid for the engines as compared with the price for which the railway companies last fall secured like engines.

Mr. Ross. It was quite low; so low, in fact, that they said that they were in hopes that the price would not be published. I told them that we could not guarantee that, because our openings were in public, and anybody that wanted to get the figures or ask for them could have them.

Senator KITTREDGE. Are you able to give the difference?

Mr. Ross. No; I do not know exactly what the difference would be; but it was a comparatively low price. The American Locomotive Works and the Baldwin Locomotive Works had been not very long before that in competition on some engines for the Japanese Government, and had made some quite low prices at that time, and I think the Baldwin Locomotive Works got the larger part of that order. I presume they made their bid on the locomotives that we wanted on an export basis. It was low as compared to the prices paid by railroads in this country, but I do not know exactly how much lower.

Senator KITTREDGE. Can you ascertain?

Mr. Ross. I might find out. Of course it depends a good deal on the weight and type of the locomotives.

Senator MORGAN. By an export basis you mean that they would sell for export cheaper than they would sell for use in the United States?

Mr. Ross. Yes, sir; the same thing that we were talking about in connection with the steel rails.

Senator MORGAN. It is the same idea.

Mr. Ross. Yes, sir.

Senator MORGAN. That same idea applies to all of the purchases that you make from foreign countries or through the agents of foreign establishments, does it not?

Mr. Ross. I do not know that I understand just what you mean. There is this to be said, Senator, that every American concern that is bidding on our requirements has to bear in mind all the time the possibility of our getting bids from foreign concerns.

Senator MORGAN. Yes; cheaper bids?

Mr. Ross. Cheaper bids; yes; and they endeavor to get down low enough to meet that competition.

Senator MORGAN. Are those foreign bidders admitted to free competition in these purchases?

Mr. Ross. Yes, sir; we make no discrimination at all.

Senator MORGAN. Other things being equal, you would give the preference to concerns in this country?

Mr. Ross. Yes; but they are hardly ever exactly the same. Everything being equal, of course our natural inclination would be to do that; but they very seldom are exactly equal.

Senator ANKENY. In filling your order for locomotives, what time do they stipulate that they shall have for the delivery of those engines or goods or whatever you may order?

Mr. Ross. We stipulated in our specifications or in our inquiry for bids the delivery that we want.

Senator ANKENY. When did you state that they must be delivered?

Mr. Ross. So many per month, showing when we wanted the delivery to commence.

Senator ANKENY. How long did you have to give them to deliver these locomotives?

Mr. Ross. The order was placed in September.

Senator ANKENY. You filed your order in September?

Mr. Ross. Yes, sir; and we wanted the delivery to commence in December or January; and all three of the companies who bid were able to make that delivery.

Senator ANKENY. They were able to commence deliveries in ninety days?

Mr. Ross. Yes, sir; anyone of them could make the deliveries that we wanted.

Senator ANKENY. In your contract with them, when you ordered your locomotives, did you have to sign a condition that this delivery might be delayed in the event that there was a strike of employees of the locomotive works?

Mr. Ross. No, sir.

Senator ANKENY. You have done that sort of thing, have you not?

Mr. Ross. Yes, sir; we have had to do that in some cases.

Senator ANKENY. But not in this case?

Mr. Ross. No, sir; not in this case.

Senator MORGAN. I wanted to ask you some questions about coal. Have you in your office the reports of the tests of steaming coals made by the Navy Department?

Mr. Ross. Yes, sir; I have a copy of them here.

Senator MORGAN. I would like to see those for a moment.

Mr. Ross. Here is the last full report of that kind that has been made. They get out pamphlets from time to time showing the chemical tests and other tests that they have made. Here is the last one, I think, that they have gotten out, which shows some tests on coal.

Senator MORGAN. Is that the last one?

Mr. Ross. Yes, sir; I got that just a few days ago. It is dated 1902. Looking over this other one some time ago, I noticed that it was an old report, and I sent over and got the last printed report they had.

Senator MORGAN. Does this report of 1902 include what is in the other one?

Mr. Ross. No, sir; these are later tests.

Senator MORGAN. Covering the same general ground?

Mr. Ross. Yes, sir; they tested very much the same coal.

Senator MORGAN. You would rely upon this later test rather than the former one?

Mr. Ross. Yes, sir; where it differed from the other.

Senator MORGAN. This appears to be a report of the Chief of the Bureau of Equipment to the Secretary of the Navy.

Mr. Ross. I can leave that copy with you if you would like to have it. I can get another.

Senator MORGAN. I would like to get a copy and ascertain whether it has been printed for the use of Congress. I want this report of these tests of coals to go in as a part of our report. It seems to me a very important matter.

Mr. Ross. This report [indicating] refers to nothing but tests on coal; it is all on that subject, while that other one takes in some other things, Senator. I was advised the other day that it was the last one that they had printed.

Senator SIMMONS. Does that document which you have in your hand, which you say includes nothing but tests, include these later tests?

Mr. Ross. No, sir. This is an earlier report. It is a very exhaustive report, but it is not as recent as the other one.

Senator MORGAN. Are there differences in the tests of the same coal?

Mr. Ross. I do not think there is very much difference where the coals tested are the same.

Senator MORGAN. So that this report that I have here now, marked "Reports of the efficiency of various coals for the United States ships, 1896 to 1898, Bureau of Equipment," would be a fair test, or a fair description, of the value of the different coals for steaming purposes?

Mr. Ross. Yes, sir. Of course they may have tested some coals and reported on them in this report that they have not covered in that report; but that is a very complete and exhaustive report on the subject. They not only show chemical analyses of the different coals they tested, but they show results obtained in stationary engines at navy-yards and the results obtained on their vessels, and they also looked into the merits of coals from a stocking standpoint, as to whether they would stock well.

Senator MORGAN. I suppose these reports are stereotyped, so that we can get copies of them from the Department?

Mr. Ross. Yes, sir; I suppose so. I can leave that copy with you, if you so desire.

Senator MORGAN. I know; but I was interested to know how we could obtain additional copies.

Senator ANKENY. What do you mean by "stocking qualities," or coal that would stock well?

Mr. Ross. There is a difference in coals with respect to what railroads call "stocking." The railroads, as a rule, through the Northwest in the summer months when they have a good supply of coal equipment, stock great quantities of coal in sheds or on the ground.

Senator ANKENY. That is, they store it?

Mr. Ross. Yes. They usually put a platform on the ground, and store a great quantity of it, so that they can use it through the winter

months when they have a great demand for their coal cars for commercial purposes; and sometimes, too, it prevents them from running out of coal when they might otherwise on account of the severe weather not be able to move it.

Senator ANKENY. It does not deteriorate, does it?

Mr. Ross. Some of it does deteriorate a great deal.

Senator ANKENY. I do not mean that it is stolen, but it does not deteriorate, does it?

Mr. Ross. There is no kind of bituminous coal that does not deteriorate some by exposure.

Senator ANKENY. Does it absorb moisture?

Mr. Ross. Yes; it absorbs moisture, and it deteriorates in its steaming qualities; and some coals a great deal more than others. Some coal also goes to pieces very rapidly. You may stock it in big lumps, and in three or four months afterwards when you come to shovel it it is all fine stuff.

Senator ANKENY. It is subject to deliquescence; continuing dampness makes it melt away?

Mr. Ross. Yes, sir; the lumps break up and it loses some of its steaming qualities.

Senator SIMMONS. When you say the coal stocks well you mean that as a result of exposure the deterioration is on an average not very great?

Mr. Ross. Yes, sir.

Senator ANKENY. Is, or is not?

Mr. Ross. Nearly all the roads that store coal pick out coals that they have found store well and lose the least in steaming quality.

Senator SIMMONS. You were speaking about these experiments and demonstrations. Do you mean that those were had on account of the coal that is consumed on the Isthmus or are they general experiments made by the Navy to test coal for Government purposes?

Mr. Ross. They are tests made by the Navy Department to get information as to the coals best suited for use in that Department.

Senator SIMMONS. Any vessels of the United States?

Mr. Ross. Yes, sir.

Senator SIMMONS. Climate has nothing to do with the effects of exposure upon coal, has it?

Mr. Ross. Well, I think it has, if it is exposed without having a roof over it.

Senator SIMMONS. I am not talking about that. I am speaking about the climate of the country. I asked that question in order that I may know whether a test to be made for coal to be used in this climate—in the Temperate Zone—would be just as effective in determining whether it would be the right kind of coal to use in the Tropics.

Mr. Ross. Yes, sir; I do not think it would make any difference in that respect.

Senator SIMMONS. You think that makes no difference?

Mr. Ross. No, sir.

Senator ANKENY. In your experience, what did you find the most economical and efficient coal for your purposes on the Isthmus for steaming those locomotives?

Mr. Ross. The Panama Railroad has tried a good many eastern coals, and the most serviceable one and the coal that they have the most demand for from their steamship connections is the Pocahontas coal. The steamship lines all seem to prefer that to any coal the Panama Railroad has had.

Senator ANKENY. That coal can be furnished as economically as any?

Mr. Ross. There is not much difference in the price.

Senator MORGAN. Mr. Chairman, there is a very important subject connected not only with the work on the canal, which is a minor part of the whole business, but this canal on both sides, it occurs to me, must necessarily become a great depot for coals, where ships can coal passing across the Pacific Ocean and back and across the Atlantic Ocean and back; and I think that we ought to furnish in our report, or in connection with it, the analyses of coal that have been made by the Navy Department, for the information of Congress and also for the information of all coal suppliers and the information of all navigators. I therefore suggest that we ask Congress for the publication of these reports, so much of the report of 1902 of the Chief of the Bureau of Equipment of the Navy as relates to coal, beginning at page 47 and ending on page 71; also the previous report of the "Efficiency of various coals used by United States ships, 1896 to 1898," made by the Bureau of Equipment. That relates to nothing else but coal?

Mr. Ross. That is all. It just covers the question of coal.

Senator MORGAN. In these two documents, when printed together, we would get the scientific tests, the actual practical tests, of perhaps all the important coal fields in the United States and some of foreign countries. I would therefore suggest that we ask the Senate to print these reports in connection, as I have indicated.

The CHAIRMAN. Are there not a good many of those that we can get now, without asking for an additional issue for this work?

Senator MORGAN. Well, I suppose this is all that exists.

The CHAIRMAN. That one?

Senator MORGAN. Yes; these two reports, I think, are all that exist on this subject.

Mr. Ross. They may have others. I think it is likely that they have others. I suppose you can get all the copies you want.

The CHAIRMAN. If we could get enough copies now, there is no necessity for having more printed, I suppose.

Senator SIMMONS. That is a valuable public document, about which I suppose very few people have any knowledge.

The CHAIRMAN. It certainly is a very valuable thing.

Senator SIMMONS. If published as a separate document dealing with that subject exclusively, I think it would be of very great value, not only to the Senators and Members, but to the public at large.

Mr. Ross. I think some of the railroads would be glad to get copies of these reports.

Senator SIMMONS. I think it would be a good idea to publish this as a separate Senate document.

Senator MORGAN. We are not likely to get too many of them, and in printing them together the whole subject could be presented at once to view.

The CHAIRMAN. How many copies would you like to have printed, Senator Morgan?

Senator MORGAN. I should say the usual number for the use of the Senate, and then the number can be enlarged afterwards if we find the document is in demand.

Senator SIMMONS. That is about 500.

The CHAIRMAN. That is the number we have had.

Mr. ROSS. One of the principal troubles that all large users of coal have who have to store coal is from spontaneous combustion. Railroads have a great deal of trouble from that source, and this report goes into that matter fully.

Senator SIMMONS. I think these documents would be valuable to manufacturers also, as well as to railroads.

Senator MORGAN. I would like to say that it has been my duty, imposed upon me by the Senate during the last summer, to make a pretty close investigation in regard to the coal supply from the Mississippi River and its affluents, and I find that we can carry coal to Colon at at least one-half the cost that you can get it there from Australia or from Wales. That, of course, will create for the different coal mines in the United States on the eastern slope of the Alleghenies and in the great basin between the Alleghenies and the Rocky Mountains an enormous market for coal for ship purposes, as well as for other commercial purposes; and I would like very much to have this paper published, so as to call attention to the vast amount of money that can be realized by our people from selling coal for the supply of ships that come and go through this canal. It is a real coaling station for every steamer that will pass through that canal from any country whatever, and I feel a great interest in building it up.

Mr. ROSS. This report contains quite an exhaustive investigation into the spontaneous ignition of coal.

Senator MORGAN. Yes.

Mr. ROSS. I have an abstract of the bids that we received here on that last lot of coal, which shows, too, the prices that were named on Welsh coal and on Australian coal, if you would like to see them, as compared with the prices on American coals. We had a bid on Australian coal of \$5.89 per ton, delivered on the Isthmus, and on Cardiff coal—

Senator ANKENY. That is, at the dock?

Mr. ROSS. Delivered at La Boca, the Pacific terminal. On Welsh coal we had a bid of \$4.86. The lowest bid on American coal was \$3.70.

Senator SIMMONS. Where was that first bid from?

Mr. ROSS. It was on Australian coal.

Senator MORGAN. If that amendment that was put into the ship subsidy bill the other day in the Senate, authorizing the establishment of three lines from ports on the Gulf of Mexico to Colon, is adopted, you will find that those prices that are included in the bids that Mr. Ross mentioned will come down 25 to 30 per cent, and we can get all the coal we use cheaper by the establishment of those lines. We have taken that step now and we have also recognized the right of the United States to those ports, in that amendment, which I very sincerely hope will pass the House. But in connection with the subject, and without particular regard to what Congress may do upon the

bill, I think that this information is very important, and I will ask, also, that Mr. Ross furnish us with a statement of those bids that we may put them into the record.

The CHAIRMAN. That will go in the record.

Mr. Ross. Yes, sir.

(The figures referred to are as follows:)

ISTHMIAN CANAL COMMISSION.

Abstract of bids for 50,000 tons bituminous coal, opened by general purchasing officer on the 20th day of June, 1905, under advertisement (serial No.) 230, dated May 22, 1905.

Name and address.	Mine run per ton, 2,240 pounds.	Screened lump per ton, 2,240 pounds.	Remarks.
1. Keystone Coal and Coke Co., New York.	\$3.75	.....	Delivery, c. i. f., Colon, loaded at Philadelphia; approximately 10,000 tons in July, balance monthly shipments 4,000-5,000 tons. Subject acceptance on or before June 25. "Greensburg" coal. Sufficient water guaranteed.
2. New River Coal Sales Co., New York.	4.00	.....	Delivery, c. i. f., Colon, loaded at Newport News; approximately 10,000 tons in July, balance monthly shipments 4,000-5,000 tons. Subject acceptance on or before June 25. "New River Peerless" coal. Sufficient water guaranteed.
3. Monongahela River Coal and Coke Co., Pittsburgh.	5.95 5.07	\$6.15 5.32	Delivery f. o. b. ship Colon, loaded at New Orleans. Cargoes 3,000 to 5,000 tons; not less than 5,000 tons per month. Best Pittsburgh bituminous coal.
4. Hartfield & Hills, Philadelphia.	3.8976	3.9424	Delivery f. o. b. ship Colon, loaded at Mobile or Pensacola. Cargoes 3,000 to 5,000 tons; not less than 5,000 tons per month. Corona mines or equal Alabama coal.
5. J. J. Hobbs, New York, agent for Pyman, Watson & Co., Cardiff.	4.256	4.8603	Delivery, c. i. f., Colon, Welsh coal, 10,000 tons in four weeks from receipt of order; 5,000 tons month thereafter. Free of duty.
6. Pennsylvania Coal and Coke Company, Philadelphia.	3.679872	.....	Delivery, c. i. f., Colon; semibituminous, Pennsylvania Coal and Coke Company's colliers; 10,000 in thirty days, 5,000 tons monthly thereafter, based on 20 feet water at Colon now, which will be increased to 25 feet in ninety days. Statement as to analysis. Steamer loaded in fifteen days from request.
7. Castner, Curran & Bullett, Philadelphia.	{ \$2.50 \$2.60	.....	Delivery, f. o. b. vessel, Lamberts Point, Virginia. Pocahontas mine-run coal. No time of delivery specified. Balance unshipped. April 1, 1906, be canceled.
8. D. L. Flack & Sons, London, England.	{ 5.06 5.57	5.28	Delivery, c. i. f., alongside wharf, steamer paying cost of unloading; Abersychan, South Wales, coal; 10,000 tons in July, 5,000 monthly thereafter.
9. Northwestern Imp. Co., Tacoma.	7.7504 3.0016	7.9968 3.248	Delivery, free ship's tackle, La Boca, shipment 5,000 to 10,000 tons monthly; Roslyn coal, Washington mines.
10. J. J. Moore & Co., San Francisco.	.....	5.89792	Delivery, ex-bunkers, Tacoma, State certificates of analysis and tests furnished.
11. Wm. R. Young, San Francisco.	4.1888 4.3904	4.3904 4.59	Delivery, ex-ship's slings on lighters, La Boca, 5,000 tons July and August, 1 cargo every 45 days thereafter. Sneddon's Northern Extended, steam coal, Australia.
12. Harry C. Richards, San Francisco.	6.96864	7.4704	Delivery, c. i. f., ship's tackle, Colon, 10,000 tons in July, 5,000 tons monthly thereafter. Corrected bid by telegram, June 19, 1906.
			Delivery, c. i. f., ship's tackle, La Boca, 5,000 tons in July, 5,000 tons every 60 days thereafter. Comox coal from Union colliery, Vancouver, British Columbia; free of duty; boiler tests submitted.

^a Prior to October 1.

^b October 1 to April.

Abstract of bids for 50,000 tons bituminous coal, opened by general purchasing officer on the 20th day of June, 1905—Continued.

Name and address.	Mine run per ton, 2,240 pounds.	Screened lump per ton, 2,240 pounds.	Remarks.
13. Fairmont Coal Co., New York.	3.6512	3.70	Delivery, c. i. f., Colon. Commenced delivery 1 month after receipt of order. Fairmont, W. Va., coal.
14. National Coal Co., Baltimore.	3.7408	3.8304	Delivery, c. i. f., Colon; 10,000 tons at once; 5,000 tons or more monthly, as directed.
15. Davis Coal and Coke Co., Baltimore.	3.93568	.....	Elk Garden, Big Vein, Georges Creek, c. i. f., wharf, Colon; 10,000 tons during first month, 5,000 tons monthly thereafter.
16. Maryland Coal and Coke Co., Baltimore.	3.81536	.....	Davis Big Vein, Cumberland.
	4.24928	.....	Delivery, c. i. f., Colon. No time specified. Big Vein of Georges Creek or standard Pocahontas.

Mr. Ross. There is one statement that I want to make. You asked me the other day, Senator Morgan, if we did not receive some bids on other coal, or whether the Canal Commission had not purchased some other coal than the lot then mentioned and I said "No." I misinformed you there, because I thought you meant some large lot we had advertised for. I find that we did, and I knew it then, if I had thought of it. We did buy a lot of about four or five hundred tons of Cahaba, Ala., coal, which the Munson Steamship Line took down to Colon as ballast. They reported that they had it there, and we finally agreed on a price and took it off their hands at a comparatively low price.

Senator SIMMONS. I move, Mr. Chairman, that Senator Morgan be authorized to present this matter to the Senate, and to ask that the part of the document that he indicates be printed as a Senate document.

(The motion was carried.)

The CHAIRMAN. Perhaps we had better have more than 500 of these printed, if it is going to be used by the railroads of the country, too. We may need an additional number.

Senator MORGAN. We will need more; there is no doubt about that.

The CHAIRMAN. We had better have the usual number printed, which, I understand, is 1,500.

Senator SIMMONS. Not only the railroads, but the manufacturing establishments will want them.

The CHAIRMAN. We might as well have enough while we are having them printed.

Mr. Ross. I would suggest, if I may, that you ask the Navy Department for all the reports that they have made recently on the subject. There may be others that I have not seen, and they can pick them out and get them all together, so that you can have them published in one pamphlet.

Senator SIMMONS. Did you advertise in Australia for bids for coal?

Mr. Ross. No, sir; only in this country; but we had several bids on Australian and Welsh coal.

Senator SIMMONS. Those bids came voluntarily, without solicitation?

Mr. Ross. From dealers in this country.

Senator SIMMONS. I mean they came voluntarily, without any solicitation from you for bids?

Mr. Ross. Without our advertising there for bids.

Senator SIMMONS. But you have not bought any coal from them?

Mr. Ross. No, sir.

Senator ANKENY. They all have agencies in this country?

Senator SIMMONS. Yes.

Senator ANKENY. I think that analysis of coals there is a very expensive thing to obtain. It is a very valuable document, and we can hardly appreciate how far-reaching its advantages will be.

Senator MORGAN. I will ask the chairman of the committee if he will write a letter to the Secretary of the Navy, as chairman, and ask him whether there are later tests and publications of the examination of coals than are presented in this book, the report of the Chief of the Bureau of Equipment for 1902. The chairman may find that other very important tests have been made since that time.

The CHAIRMAN. That will be done.

Senator MORGAN. And if so, that they be incorporated in this document that I have just been alluding to.

The CHAIRMAN. That will be done.

Senator MORGAN. I think they undoubtedly have made further tests. They may not have had printed reports of them yet. Of course we want to get them all together and have them printed in connection with each other.

The CHAIRMAN. Yes. Are there any other questions to be asked Mr. Ross?

Senator MORGAN. I have no more questions.

Mr. Ross. There are a few more things that I wish to state to the committee that I overlooked the other day. I have a memorandum of them here.

The CHAIRMAN. Very well. Proceed then, and I think we can get through with you, probably, before recess.

Mr. Ross. I neglected to state the other day, in response to Senator Morgan's inquiries about the methods of making the awards, that I always have to obtain from the chairman of the Commission his written approval before making an award to anyone except the lowest bidder. I get his approval in writing and send it to the Auditor. The Auditor would not pass our vouchers without a written approval of that kind.

Senator KITTREDGE. Does that approval contain the reason for such action?

Mr. Ross. Yes, sir. Whenever it does not look right to make an award to the lowest bidder, on account of the quality not being up to the specifications or on account of the delivery not being quick enough, or for any other reason of that kind, I write to the chairman and outline the prices bid by the different bidders, and any other facts in connection with them as to the quality of the material or the delivery, or anything of that kind.

Senator MORGAN. You leave the decision to him, instead of making it yourself, in those cases?

Mr. Ross. Yes, sir. Wherever we can conveniently do so, I always submit all the bids that we get to the officer making the requisition in the first place. If Mr. Stevens should be here, and we have any bids that have recently been opened in which he is particularly interested, I ask him to go over the bids. If any of the division engineers are up here who have made requisitions I get them to go over the bids

themselves and make their recommendations as to the awards that should be made; and sometimes when they are not here and it is something that I think they ought to study over themselves I send the papers down to the Isthmus, if time will permit, for them to go over. It does happen occasionally that we have time enough to do that.

Senator MORGAN. That brings in view a very important inquiry, as to whether it is practicable in a business way so to consolidate these different offices and agencies of the Isthmian Canal Commission as that they can be located in the Zone—your office and the auditor's office?

Mr. Ross. Well, I suppose we could get along, if absolutely necessary, but it would mean a good deal of delay in getting in bids, and it would also be a very great inconvenience to the people who wanted to bid, because they can come around to the office here and make inquiries or telegraph and get information. We would not get as many bids as we do now.

Senator MORGAN. You think, then, as a business proposition that it is better to have the purchasing agency at Washington than to have it on the Zone?

Mr. Ross. It would be better to have it in this country somewhere, where the people could get access to the office.

Senator MORGAN. I take this city as being about as central as any other.

Mr. Ross. Yes, sir.

Senator MORGAN. Would that also apply to the auditor's office, do you think?

Mr. Ross. It would for this reason, that before we can pay any of our bills the auditor has to audit them. He checks them over and sees that the extensions are correct and that I have complied with the requirements. He keeps pretty close tab on me.

Senator KITTREDGE. Do you refer to the Auditor for the War Department or the general auditor of the Commission, Mr. Benson?

Mr. Ross. I refer to the general auditor of the Commission, Mr. Benson.

Senator KITTREDGE. They do not pay any money on his audit?

Mr. Ross. Yes, sir; all our invoices are audited by him before they go to the disbursing officer for payment.

Senator KITTREDGE. They pass through his hands and then they go to the Auditor for the War Department, do they not?

Mr. Ross. After they are paid they go to the Auditor for the War Department.

Senator KITTREDGE. After what are paid?

Senator MORGAN. There is a difficulty that seems to me to be very serious indeed. The auditor of the Isthmian Canal Commission at the city of Washington passes upon a demand, an account against the Government, and the disbursing officer either here or at the Zone pays that account or claim, or whatever it may be; then it comes back to the War Department, and it is subjected to an additional audit and may be rejected by the Auditor for the War Department, and that is a final decision, if I understand it. A claim that has been audited here and has properly passed through every phase of examination by the officers of the Isthmian Canal Commission may be

rejected in the War Department, and that throws the responsibility upon the disbursing officer, if I understand the situation.

Senator KITTREDGE. The purpose of my questions was to ascertain the exact fact about that in concise form.

Senator MORGAN. Will you make the inquiry?

Senator KITTREDGE. If you wish.

Senator MORGAN. Yes.

Senator KITTREDGE. Mr. Benson makes an audit of certain claims against the Canal Commission?

Mr. Ross. Yes, sir.

Senator KITTREDGE. Have you a disbursing officer here in Washington who makes payments?

Mr. Ross. Yes, sir.

Senator KITTREDGE. Who is he?

Mr. Ross. Mr. James G. Jester.

Senator KITTREDGE. Is he connected with the Army and Navy, or was he taken from civil life?

Mr. Ross. I think he was in the War Department before his appointment on the Commission's staff.

Senator KITTREDGE. In what manner and to what extent are funds placed in his hands to make payments of the character you have described?

Mr. Ross. Of course that is something that I have not much connection with, but, as I understand, funds are placed to his credit from time to time, on the approval of the chairman, subject to his drafts, and when the amount placed to his credit is about to run out he takes the matter up and gets a further credit.

Senator KITTREDGE. He makes a requisition for further funds?

Mr. Ross. Yes, sir. We also have a disbursing officer on the Isthmus, Senator.

Senator KITTREDGE. Yes; I understand about that, perhaps not from your testimony, but from the testimony of some witnesses who have appeared before the committee here.

Mr. Ross. This is true, as Senator Morgan says. I know that it worries the disbursing officers a great deal. No matter how carefully the general auditor audits all of our accounts, if a mistake of any kind is made, his audit does not relieve the disbursing officer of responsibility at all, so that they feel called upon to go over the papers themselves to assure themselves of the correctness of the invoices before making payment.

Senator SIMMONS. What is the amount of bond that the disbursing officers give?

Mr. Ross. I do not know, sir.

Senator HOPKINS. There is nothing harmful in that to the Government?

Mr. Ross. No, sir; it is an additional check; except that it delays things a little. Vouchers do not go through for payment and pay rolls are not paid as promptly as they would be if the disbursing officer was released of responsibility after he receives the O. K. of the auditing officer, as is the case with railroads. On a railroad, a disbursing officer, cashier, or paymaster has no responsibility whatever when he gets a voucher properly approved and audited by the auditor. All he has to do is to pay it, and if there is any trouble

about it afterwards he is not responsible at all. But that is not the case with the disbursing officers of the Government.

Senator KITTREDGE. What duty does the Auditor for the War Department perform with reference to claims presented against the Commission here in the city of Washington?

Mr. Ross. I do not know exactly. I know that after the bills are paid, after the invoices are paid, they are sent over to the Auditor for the War Department, and, I presume, he checks them over and satisfies himself that they are correct.

Senator KITTREDGE. Does he do more than to check up the account of the disbursing officer of the Canal Commission?

Mr. Ross. I imagine not. I presume that is all that he does. I do not know how much work he does in that direction.

Senator SIMMONS. Has he ever disapproved a single payment?

Mr. Ross. I do not know of any. He may have. That is something that might happen without my knowing it, because I have no connection with that part of the work.

Senator KITTREDGE. Why is it necessary to have the double audit?

Mr. Ross. Well, I do not think that our people think it is necessary. I think they have made a recommendation that that be simplified in some way.

Senator KITTREDGE. Do you remember what the recommendation of the Commission is in that respect?

Mr. Ross. My recollection is that they have recommended that our invoices and accounts, after being audited by the general auditor of the Canal Commission, go direct to the Auditor for the Treasury Department.

The CHAIRMAN. You mean go direct to the Comptroller of the Currency of the Treasury, do you not?

Mr. Ross. The Comptroller of the Treasury instead of the Auditor; yes.

The CHAIRMAN. Yes.

Senator KITTREDGE. Why not have the Auditor for the War Department audit your accounts?

Mr. Ross. The Comptroller of the Treasury is the final auditor. He finally audits all the accounts against the United States. I understand everything finally winds up in his office.

Senator KITTREDGE. I understand that.

Mr. Ross. He would have to get them, anyway.

Senator KITTREDGE. Why not have the Auditor for the War Department audit your accounts, or the claims against the Commission?

Senator HOPKINS. Instead of having Mr. Benson as auditor?

Senator KITTREDGE. Yes.

Mr. Ross. The Secretary of War explained that very carefully before the Senate Appropriation Committee. The Auditor for the War Department only audits accounts after they are paid, and sometimes, as the Secretary of War said, quite a long while after they are paid, while Mr. Benson audits all accounts, pay rolls, and bills, and everything like that, before they are paid. The Secretary of War was very much in favor of having them audited before they were paid, instead of having bills paid and money paid out of the Treasury and finding out several months afterwards that they were incorrect.

Senator MORGAN. Is it your suggestion that all these claims that have been audited shall go to the Treasury before they are paid?

Mr. Ross. No, sir. I am in favor of having them paid as soon as they can be, because the sooner people get their money the cheaper we can buy material. That is not done now in any case in any department, as I understand it. In most of the other Departments the accounts are paid with less auditing than they are in our case before they are paid, because the final audit comes after the payment, while in the Commission's case the papers are very carefully audited by Mr. Benson before any payments are made.

Senator MORGAN. You think that audit ought to be a final audit?

Mr. Ross. Yes. I know Mr. Benson goes into these matters very carefully. He sends down to my office every day or two—every day, almost—for additional papers. I might also say in that connection that I send to the general auditor two copies of each of the bids that we accept. I get three bids on this blank form and keep one for my own files and send the others to him, and he keeps them on his records. I think he gets two. I do not know what he does with both of them.

There are one or two other things that I thought I might mention to the committee. The practice formerly was to require the deposit with each proposal of a certified check for 10 per cent of the aggregate amount of each proposal or a guaranty to cover the proposal. There were a number of people who told me that they would be glad to have us arrange for an annual guaranty, so that they could file it once a year and not be bothered with getting out a guaranty every time they made a bid, which with some of them is every few days. We had one very carefully drawn, so that it would hold water in case of trouble; and a great many of the bidders have availed themselves of it and filed annual guaranties, so that they can make bids whenever they please, without going to the trouble of making a separate guaranty for each proposal.

Senator MORGAN. These guaranties come from guaranty companies, do they?

Mr. Ross. Nearly all of them. We do give them the privilege of filing individual guaranties, but very few bidders avail themselves of it. They nearly all are surety company guaranties.

Senator DRYDEN. Do you have any selected list of surety companies, or do you leave it open?

Mr. Ross. Yes, sir; we have an approved list.

Senator DRYDEN. How many such companies are permitted to give their guaranties?

Mr. Ross. I should judge there must be about fifteen or twenty altogether.

There is another thing in connection with the inspection of material that I thought it might be well to mention to the committee. We reserve the right of final inspection of everything on the Isthmus. That is done to make sure that we get what we are advertising for and what we pay for; and it is a very good thing, because if we do get an incompetent inspector up here we have another check on the material on the Isthmus, a check by the people who use it and who are very familiar with the quality and know what they want, and they do inspect all the material on the Isthmus before they check and receipt the bills, so that we have a double check on the quality of the material that we get, and it also prevents any possibility of loss through collusion between inspectors and shippers up here.

The CHAIRMAN. Before payment is made, then, everything goes to the Isthmus, and there it is audited, and then it comes up here and is audited, and on that final audit of your office the payment is made?

Mr. Ross. Mr. Benson never makes a payment until he gets the receipt on the bill itself of the officer to whom the material is sent on the Isthmus.

The CHAIRMAN. It all has to be delivered at Panama before payment is made here?

Mr. Ross. Unless it is some small item that we buy here for an emergency for delivery at some port in this country.

The CHAIRMAN. Suppose a bidder is going to furnish supplies shipped from New York, how long would it take to finally get around to the point where he would get his money?

Mr. Ross. This summer there was considerable delay in getting bills paid, but we got a man for chief of the supply division down there in November who has made a very good record in getting all of the old bills checked up and returned. I get a weekly report from him, a report on each steamer. He has returned all of the bills that were dated in this country prior to January 1, 1906, and has now returned quite a number of bills dated as late as January 12 and 15. You see they may be dated, too, several days before the steamer sails with the goods. As I have told a number of people, we ought to be able to pay our bills within thirty to forty days from the arrival of the material at the Isthmus. I wrote a special letter just to try to encourage people that are doing business with us who had suffered some delay in getting their bills paid, telling them of the fact that we had secured the services of this man as chief of the supply division and of the arrangement he had made for the early certification of all bills.

The CHAIRMAN. Of course delay in payment would necessarily affect your prices?

Mr. Ross. That was the reason we were so anxious to get that matter straightened up and the reason that I wrote this special letter to people that I knew had suffered from the delay, so as to encourage them to keep on bidding, and so as to keep them from adding any interest to their prices.

Senator MORGAN. If we should adopt the contract system of building this canal, letting it out on contract, we would get rid of all this auditing and purchasing, would we not?

Mr. Ross. We might get rid of a good deal of the purchasing, nearly all of the purchasing, but you would not get rid of the auditing. The auditor would have to audit the bills of the contractors, and that would involve considerable work.

Senator KITTREDGE. How much work would that involve?

Mr. Ross. Not as much as is required now.

Senator KITTREDGE. It would be very slight, would it not?

Mr. Ross. There would still be considerable auditing to do.

Senator KITTREDGE. That would depend upon the estimates furnished by the engineers in charge of the work, would it not?

Mr. Ross. Yes, sir; there would not be the amount of accounting that there is now. Still, there would be considerable.

Senator KITTREDGE. What work would it require to do that?

Mr. Ross. Well, the contractors would submit their bills from time to time for partial payments—

Senator KITTREDGE. But that would all come up on the estimates of the engineers in charge, would it not?

Mr. Ross. The estimates of the engineers in charge would have to be checked carefully. The engineers in charge would simply O. K. the bill of the contractor, and then the Auditor would go over it and see whether or not the charges made were in accordance with the contract. That would have to be done. Of course there would not be so much miscellaneous work to do in the accounting department as there is now.

Senator KITTREDGE. The work would be very slight, by comparison, would it not?

Mr. Ross. It would depend, of course, largely upon the number of contracts that were made. If there was only one made for all the work, or comparatively few, it would mean less work; but if they split it up in a great many contracts there would still be considerable work for the accounting department to do.

The CHAIRMAN. Is there anything else that you wish to suggest, Mr. Ross?

Mr. Ross. There is this that I thought I might say: When I first came into the purchasing department of the Canal Commission I found a great many things that were very different from the methods of purchasing for railroads. I had thought of the matter somewhat before, and knew that there was not any use trying to apply railroad methods to purchasing for the Government. The longer I have been here the more I have been able to see reasons for the present methods of purchasing materials. Every man in the country who has anything that he wants to sell to the Government has just as much right, and feels that he has, as anybody else has to sell it; and by the Government's methods they all really get a chance at it, while railroads and other corporations buy from anybody they please. They do not feel that they have any obligation to give everybody a chance. They buy from the same people frequently year in and year out without giving other people an opportunity as the Government does. There is a very good reason for the present methods adopted by the Government in making purchases. Everybody has the same opportunity, and if they deliver material of proper quality and at the right prices, they have every opportunity to get the business.

Senator SIMMONS. Do you open the bids to everybody alike, and make no effort to distribute these purchases in different sections of the country, so as to equalize the amount purchased here and there in the country?

Mr. Ross. No, sir. While you were away the other day I had that question up here.

Senator SIMMONS. Then you need not go over it again.

Mr. Ross. We advertise all over the country, and take the lowest bid we get from any section. I talked about that the other day, and you will see in the record that I said if we sent part of our requisitions to one section and part to another we would be paying a great variety of prices for the same thing.

I thought I might say something about the duties of the assistant purchasing agents. We have an assistant purchasing agent at New Orleans, one at New York, one at Tacoma, and a quartermaster of the Army also acts as assistant purchasing agent at San Francisco.

Senator KITTREDGE. Have you read the statement of Mr. Benson before this committee upon that subject?

Mr. Ross. Yes, sir.

Senator KITTREDGE. Have you anything that you wish to add to his statement regarding your assistant purchasing agents?

Mr. Ross. I do not recall exactly what he said on the subject. I wanted to make a statement as to their duties, because I did not think they were understood.

Senator KITTREDGE. He went over that subject, and I was wondering if you had anything to add or any change to make in his statement. If not, perhaps it would be a duplication of the record.

Mr. Ross. I just wanted to say that their titles are to a certain extent misleading. They distribute these circulars for us and give people all the information they can about our requirements, but the bids are opened in the Washington office, as I explained the other day. They look after the shipment of material and the inspection of it and "punch up" the delivery of the material in their particular sections of the country. Now, on account of the great demand for material, buying it is one thing and getting it is another. It is harder to get it after it is bought than it is to buy it there is such a great demand for material. You have to keep after the contractors, by letter and wire, and sometimes send people to their plants to get stuff out.

I have a clerk in my office who does absolutely nothing but keep after the delivery of material—"puncher clerk," we call him. He was assigned to that work, and he does nothing else but hurry up the delivery of material, by letter and sometimes by telegram, when we get cables from the Isthmus about something they want. We have the assistant purchasing agents doing the same thing with the people in their territories. They go to see them and hurry them up and hound them until we get the stuff we want badly started on its way. Those are their duties more than purchasing, to a large extent—to look after the forwarding and hurrying the delivery of material and the inspection of it in this country. Outside of that their other duties are performed by these quartermasters. We do not ask the quartermasters of the Army to do that sort of work for us, but they do distribute our circulars for us and do nearly as much other work as the assistant purchasing agents do. It is very important to keep after the manufacturers and contractors in regard to the delivery of material.

Senator MORGAN. You can not afford to take the risk of the tardiness of the bidders in sending in their material?

Mr. Ross. Some of them would never ship it. They would make a bid, and if they found out afterwards that their bid was a little low and the price of the articles had gone up some of them never would ship the material if we did not keep after them.

Another thing that I overlooked the other day is that when we do make purchases in the open market, in emergencies, without advertising, we send a statement to the Auditor. We have to do that. We send him a statement showing the persons that were invited to bid, and whether or not the award was made to the lowest responsible bidder—practically the same thing that we do in the case of advertising. We always have to have competition, and do have as much as

we can get or have time to get, even in the case of open-market emergency purchases. Of course sometimes we can not get competition if we have to get something that can only be obtained from one concern, such as some repair parts.

Senator SIMMONS. I move that we take a recess.

The CHAIRMAN. Is there anything else that you wish to state to the committee, Mr. Ross?

Mr. Ross. Nothing, unless you wish to ask me further questions.

The CHAIRMAN. We are much obliged to you for coming, and we will excuse you now. If there is anything else that we wish to know from you we will call you again.

Mr. Ross. If there is anything else that you wish I shall be very glad to furnish it.

(The committee thereupon went into executive session, after which it adjourned until Saturday, February 24, 1906, at 11 o'clock a. m.)

ISTHMIAN CANAL.

COMMITTEE ON INTEROCEANIC CANALS,
UNITED STATES SENATE,
Washington, D. C., Monday, February 26, 1906.

The committee met at 2 o'clock p. m. (no session having been held on Saturday last).

Present: Senators Millard (chairman), Platt, Kittredge, Dryden, Knox, Morgan, Taliaferro, and Simmons.

TESTIMONY OF WILLIAM NELSON CROMWELL, ESQ.

Mr. CROMWELL was duly sworn and testified as follows:

The CHAIRMAN. Mr. Cromwell, we wanted you to come before this committee to-day, knowing, of course, your familiarity with this enterprise from its beginning. I will ask you first to give the stenographer your name and residence.

Mr. CROMWELL. My name is William Nelson Cromwell; my residence is 12 West Forty-ninth street, New York City.

The CHAIRMAN. And your business?

Mr. CROMWELL. My occupation is that of a lawyer, a member of the firm of Sullivan & Cromwell, New York City; my age is 52 years.

The CHAIRMAN. Now, Mr. Cromwell, be kind enough to proceed and give us a statement of your connection with this enterprise from its beginning as nearly as you can.

Mr. CROMWELL. Mr. Chairman, I observe from the testimony before the committee that it is a matter of interest upon your part to more definitely learn the facts concerning certain subjects relating to Panama Canal affairs with which I have had anything to do since the purchase of the canal by the United States, and I thank you for the opportunity. My law firm, Sullivan & Cromwell, have been the general counsel of the Panama Railroad Company for over twelve years and of the New Panama Canal Company for nine years.

Senator MORGAN. Beginning at what dates?

Mr. CROMWELL. Will you permit me, Senator, to read the statement, and then—

Senator MORGAN. Do you not remember the dates?

Mr. CROMWELL. The dates were 1893 and 1896, respectively.

My law firm, Sullivan & Cromwell, have been the general counsel of the Panama Railroad Company for over twelve years, and of the New Panama Canal Company for nine years. We never had any connection with the so-called De Lesseps Company, which failed in 1889. In May, 1904, I, representing the New Panama Canal Company, and

Judges Day and Russell, representing Attorney-General Knox, consummated in Paris the transfer to the United States of the property and concessions of the canal company, and of over 98 per cent of the capital stock of the railroad company. In consideration for this transfer the United States paid to the canal company the sum of \$40,000,000. This sum was paid by the United States through Messrs. J. P. Morgan & Co., as their agents, into the Bank of France, at Paris. By agreement the entire expense of the transmission of this sum to France through said bankers was borne and paid by the New Panama Canal Company. The amount of said expense was \$35,790, and was paid to J. P. Morgan & Co., as their only compensation.

Of the \$40,000,000 thus paid by the United States Government, \$25,000,000 was paid to the liquidator of the old Panama Canal Company, under and in pursuance of an agreement entered into between the liquidator and the new company, which agreement was authorized by the French courts; and of this sum the liquidator has already distributed \$24,000,000 to the security holders and creditors of the old French company.

Senator MORGAN. How much was paid?

Mr. CROMWELL. Twenty-five million dollars was paid; \$24,000,000 was distributed.

Senator MORGAN. What was the sum? You say 25 per cent; of what amount?

Mr. CROMWELL. I am not talking about 25 per cent; I am talking about dollars.

Senator MORGAN. Oh, yes.

Mr. CROMWELL (continuing his statement). Which agreement was authorized by the French courts, and of this sum the liquidator has already distributed \$24,000,000 to the security holders and creditors of the old French Company. Of the balance of \$15,000,000 paid to the New Panama Canal Company, \$12,000,000 have already been distributed among its stockholders, and the remainder is now being held awaiting final distribution and payment, and will, in due time, be applied to the cost and expenses of liquidation, the payment of any indebtedness, and for a further dividend to its stockholders.

Senator TALIAFERRO. There is \$3,000,000?

Mr. CROMWELL. In the summer of 1904—

Senator TALIAFERRO. I asked a question.

Mr. CROMWELL. Oh, certainly, sir.

Senator TALIAFERRO. There is three millions of dollars.

Mr. CROMWELL. Three million dollars; yes, sir.

Senator TALIAFERRO. Who holds that money?

Mr. CROMWELL. The New Panama Canal Company, in its treasury. The New Panama Canal Company, sir, is in liquidation under judicial procedure and accountable to the court for all of its funds.

In the summer of 1904, after the transfer to the United States, I was appointed general counsel for the Republic of Panama and legal adviser to its fiscal commissioners, who were appointed to invest as a permanent fund \$6,000,000 of the amount paid by the United States to the Republic of Panama.

From the outset President Roosevelt manifested a keen interest in this investment by the Panama Republic, and expressed to me his earnest hope that the funds would be wisely and judiciously invested so as to secure the prosperity of that country, and he urged upon me

to use my best endeavors to that end. I communicated his views to the Panama Government, and the fiscal commissioners afterwards called upon him with me and expressed their grateful appreciation of his interest and their accord with his views. Several months were devoted by the commissioners and their counsel to the investment of these funds, and the result is a just source of pride to the Panama Government and all concerned.

With regard to the disposition of the \$10,000,000 paid by the United States Government in May, 1904, to the Republic of Panama, I am permitted by the Government of the Republic to furnish a statement of the disposition of said moneys, certified by Mr. J. D. de Obaldia, its minister to this country, which is as follows:

Memorandum of the general disposition by the Republic of Panama of the \$10,000,000 paid by the United States to its fiscal agents, Messrs. J. P. Morgan & Co., May 2-20, 1904.

Investment in 32 first mortgages upon improved real estate in the city of New York at $4\frac{1}{2}$ per cent interest, all recorded in the name of the Republic	\$5,165,500.00
\$790,000 $4\frac{1}{2}$ per cent bonds of the Panama Railroad Company in vaults of J. P. Morgan & Co., fiscal agents.....	834,343.75
Cash on deposit to credit of the Republic with New York Trust Company, \$575,000; and Morton Trust Company, \$575,000, under certificates of deposit at 3 per cent interest per annum	1,150,000.00

These items are all there now, gentlemen.

Cash on deposit with Bankers' Trust Company, of New York, as trustee of gold-reserve fund equal to 15 per cent of the Panama coinage of 4,000,000 pesos under the agreement respecting the parity of gold with silver, bearing interest at 3 per cent per annum.....	\$300,000.00
Cash on deposit to credit of Republic with J. P. Morgan & Co., fiscal agents, and Bankers' Trust Company, at New York, at 2 per cent per annum.....	71,280.62
Cash on deposit at London with Comptoir National di Escompte to the credit of the Republic of Panama.....	632,690.00
Cash on deposit to credit of Republic at 2 per cent interest with bankers at Panama under contract with Panama Government, dated August 16, 1905 (Gaceta Oficial No. 149).....	150,000.00
Cash invested by Panama Republic under law 74 of 1904 in establishing the Banco Hipotecario at Panama (a national bank).....	500,000.00
By law 52 of 1904, there was appropriated "from the payment on account of the canal" the sum of 3,250,000 pesos (\$1,625,000 gold) for the construction of public works in the seven provinces as follows:	
Province of Panama	\$500,000
Province of Colon	150,000
Province of Chiriqui.....	225,000
Province of Cocle	175,000
Province of Los Santos.....	175,000
Province of Veraguas.....	175,000
Province of Bocas del Toro.....	225,000
Of this sum there has been expended in public buildings, roads, and other improvements to date.....	573,000.00
By drafts of Panama Government on Messrs. J. P. Morgan & Co., fiscal agents, from time to time	622,615.52
Expenses of fiscal commissioners for accountants, cables, postage, etc..	570.11

10,000,000.00

From this statement it will be seen that the Panama Government to-day holds intact \$8,800,000 of this amount, of which \$5,165,500 is invested in $4\frac{1}{2}$ per cent first mortgages upon improved real estate in the city of New York, \$834,343.75 in the $4\frac{1}{2}$ per cent gold bonds of the Panama

Railroad Company, and over \$2,800,000 in cash deposited in the trust companies and banks named, bearing interest at rates varying from 2 to 3 per cent, and that considerable of the balance of said sum has been put into public improvements on the Isthmus.

Neither I nor my firm have been the attorneys for the Isthmian Canal Commission or for the Government; but on several occasions the President and the Secretary of War have sought information and advice from me with relation to particular topics when it seemed so them, by reason of my familiarity with the Isthmus and the canal, that I could be of assistance.

One of these subjects related to the differences that had, unhappily, grown up between this Government and that of Panama concerning the application of the Dingley tariff in the Canal Zone, the establishment by the Zone authorities of new ports of entry near Panama and Colon, postal regulations, etc.

At the request of the President and the Secretary of War I accompanied the Secretary when he went to the Isthmus in November and December, 1904, with Admiral Walker, then chairman of the Commission, and Judge Magoon, its general counsel, and I rendered to both Governments every assistance within my power, resulting in the harmonious and successful adjustment of all pending questions.

Another subject upon which this Government asked my aid was the purchase of the outstanding minority interest of the Panama Railroad stock. This outstanding interest naturally gave the Government great concern. The Government recognized that if the interests of the minority were disregarded litigation might result. For many practical reasons, too, it became of vital concern that the United States should have complete ownership. Both Houses of Congress initiated legislation to accomplish the retirement of this minority interest, but no law was passed.

You remember that the two Houses failed to come to a concurrence at the last session.

At this stage the President and the Secretary of War charged me with the task of acquiring, if possible, all of the outstanding minority stock. The efforts of the old De Lesseps régime, as well as of the New Panama Canal Company, to acquire this outstanding minority had never been successful.

Senator KNOX. What did it amount to in dollars?

Mr. CROMWELL. The total shares were about 1,100.

Senator KNOX. I mean how much in par value?

Mr. CROMWELL. About one hundred and ten or one hundred and twenty thousand dollars, probably.

I devoted myself to the subject with every resource within my power and reached every individual stockholder in England, France, Italy, the United States, and elsewhere, and succeeded in purchasing and delivering to the Secretary of War every single share of the outstanding minority stock, some of the certificates for which had been held by their owners for over forty years. This was accomplished without the payment by the Government of any compensation, commission, or profit of any kind.

Senator TALIAFERRO. What did this stock cost, Mr. Cromwell?

Mr. CROMWELL. Roughly speaking, about one hundred and forty or one hundred and fifty thousand dollars. The accounts are on file.

Senator TALIAFERRO. I notice that your language there is that no compensation was paid by the Government.

Mr. CROMWELL. None was paid by the Government.

Senator TALIAFERRO. That implies that there was compensation paid.

Mr. CROMWELL. No, sir; it implies that there was cost in the purchase of the stock, sir.

My final account, with the vouchers of payment audited by the Government department, are in the Government files, and every share of stock is now in the Treasury of the United States, acquired at cost.

The establishment of a sound monetary system by the Republic of Panama—

Senator MORGAN. Let me inquire there whether it does not require an ownership of stock to qualify a man to act as a director?

Mr. CROMWELL. It does, sir; and I will be happy to explain that, if you will permit me, later. I have taken great pains about that, Senator, and I am sure, as a lawyer, you will feel a deep interest in what I will state to you as to the method we have adopted in that regard.

Senator MORGAN. Yes.

Mr. CROMWELL. The establishment of a sound monetary system by the Republic of Panama was of the highest importance to that Republic, and obviously of interest to the United States in connection with the construction of the Panama Canal. The Republic of Panama has met the highest ideal of national honor in this regard. It established by law the gold standard. It created a gold reserve fund to maintain the parity of its silver with gold, and deposited this reserve with the Bankers' Trust Company of New York as a trust fund for this purpose. It established a coinage of its own of the aggregate amount of 4,000,000 pesos, equivalent to \$2,000,000 gold, and redeemed and retired the Colombian currency theretofore current on the Isthmus.

While the standard of currency was thus wisely established by Panama, something else was necessary to maintain commercial stability and prevent the violent fluctuations of exchange with the consequent injuries. Prior to 1904 both the New Panama Canal Company and the Panama Railroad Company found it necessary to make agreements with the bankers of the Isthmus looking to the regulation of this exchange. The Walker Commission, realizing the necessities of the case, gave anxious consideration to devising means by which the rates of exchange would be controlled, and it was proposed by the Commission to encourage such result by the deposit of \$1,500,000 in some American bank having a branch at Panama. Some doubt existed as to the legal power of the Commission to make such deposit of the canal funds; and to obviate this difficulty a bill was introduced in the Senate during the third session of the Fifty-eighth Congress, known as Senate bill 7207. The Senate fully realized the necessity for action and passed the bill in the following form:

"That to enable the United States to secure at all times a sufficient supply of money to meet the necessities of the Government on said Canal Zone, the President is hereby authorized to deposit such sum of money as he may deem sufficient for said purposes, not to exceed one million five hundred thousand dollars, of any sums appropriated for canal purposes, in some bank or banks in the United States having a fiscal agent on the Isthmus of Panama, to be selected by the President:

Provided, That such deposit shall be on terms which shall preserve the title to said money in the United States, enable the United States to withdraw said funds from said deposit at any time, and proper and sufficient security be given by the bank of deposit for the return of said money or the lawful accounting therefor."

As this measure, however, failed to pass the House and become a law, and some other solution was imperative, I was then requested by the President of the Republic of Panama and by the Secretary of War of the United States to assist in the solution of the difficulty. During several months I was engaged with the Secretary upon this subject in studying the problem, reconciling interests, and bringing the principal bankers of the Isthmus and the American bank having an agency on the Isthmus into accord.

Senator MORGAN. You mean you were engaged with the Panama Secretary?

Mr. CROMWELL. I was engaged, as I have said, with the Secretary of War of the United States.

Senator MORGAN. Of the United States?

Mr. CROMWELL. Yes, sir.

Senator MORGAN. I misunderstood you.

Mr. CROMWELL. It was the subject of frequent conferences upon the part of Secretary Taft, Mr. Shonts, as chairman of the Commission and president of the railroad, and myself. You have before you the agreement which was thus reached, dated April 29, 1905, by which the United States is furnished upon its drafts all the silver it may demand for its use at par, without commissions, premiums, or charges of any kind.

Senator MORGAN. What is meant by par there, Mr. Cromwell?

Mr. CROMWELL. Just exactly what the agreement says.

Senator MORGAN. Well, what is meant by it, the par of gold or the par of silver?

Mr. CROMWELL. The par of silver to gold—upon exact parity.

Senator MORGAN. It is the par of gold, then, is it?

Mr. CROMWELL. Two dollars of Panama silver produces \$1 of American gold.

Senator MORGAN. Well, that is not par.

Mr. CROMWELL. I think it is, sir.

It is furnished all the United States currency which it may call for at a fixed rate of exchange of three-fourths of 1 per cent gold. The agreement also insures general commercial stability and protects the public by providing that the public shall be furnished exchange at a rate which shall not exceed 2 silver pesos (the equivalent of \$1 in gold) and 3 cents Panama currency (the equivalent of $1\frac{1}{2}$ cents in gold) for each \$1 United States currency, or $1\frac{1}{2}$ cents gold for each \$1 gold. By this arrangement the object of the Commission, the railroad, and the Panama Government was accomplished without the deposit of \$1,500,000, as proposed by the Senate bill, or the risk of involvement of any Government deposit, and without subjecting the United States to the possibility of the loss of a single dollar, for the United States in every instance receives the actual coin upon presentation of its draft.

Neither the Commission, the railroad company, nor the United States Government has one dollar on deposit with any of these bankers. On the contrary, the bankers give credit to the United States for the time which is consumed in transmitting the draft of the United States to

New York for collection. This arrangement is very advantageous to the United States, and was meant by all concerned to be so. It expires on April 29 next.

With reference to the retirement of Mr. Wallace, I notice that he has given you an explanation as to his retirement radically different from that which he gave at the time.

Senator MORGAN. What do you mean—to whom?

Mr. CROMWELL. At that time, June and July, 1905—

Senator MORGAN. Wait a moment, please. To whom was that explanation given at the time that you speak of?

Mr. CROMWELL. It was given to Secretary Taft.

Senator MORGAN. In your presence?

Mr. CROMWELL. It was. At that time he made four formal statements, giving his reason for his action.

First: Upon the Isthmus, before leaving, he stated that he had decided to accept a position offering a larger salary, and was leaving the Isthmus to retire.

Senator MORGAN. To whom did he make that statement?

Mr. CROMWELL. I will presently explain, sir.

Second: At the Hotel Manhattan on June 25, 1905, at his interview with Secretary Taft, of which the Secretary himself has given a complete account, and which has been published—

Senator MORGAN. Published where?

Mr. CROMWELL. In the public press.

Senator MORGAN. In what paper?

Mr. CROMWELL. I do not know.

Senator MORGAN. How do you know anything about it if you do not know the paper it was published in?

Mr. CROMWELL. I read it at the time, sir.

Senator MORGAN. You are stating, then, your recollection of what was stated in a public paper without naming the paper?

Mr. CROMWELL. I can easily produce one.

Senator MORGAN. Will you do it?

Mr. CROMWELL. With pleasure.

Senator MORGAN. That is right. Put it in the record.

Mr. CROMWELL. Second: As I have said, at the Hotel Manhattan, on June 25, 1905, at his interview with Secretary Taft, of which the Secretary himself has given a complete account and which has been published. At this interview Mr. Wallace stated his reasons, none of which made any reference to me.

Third: On the day following the Manhattan Hotel interview, namely, on June 26, Mr. Wallace wrote to Mr. Shonts, the chairman of the Commission, a letter stating the reasons for his action, and again not making the least allusion to me as a cause therefor.

Senator MORGAN. Have you a copy of that letter?

Mr. CROMWELL. With the permission of Mr. Shonts—I did not mean to disregard your question, Senator, because my succeeding sentence refers to that matter.

Senator MORGAN. Yes; very good.

Mr. CROMWELL. With the permission of Mr. Shonts I quote from this letter, written the day after the Manhattan Hotel interview of June 26, as follows—

Senator MORGAN. Have you the whole letter?

Mr. CROMWELL. I have a copy of the whole letter; yes, sir.

Senator MORGAN. Have you it with you?

Mr. CROMWELL. No, sir; Mr. Shonts furnished me this extract.

Senator MORGAN. I want to see that entire letter, Mr. Chairman.

Mr. CROMWELL. It is of no concern to me.

Senator MORGAN. Well, it is of concern to me. I want to see that entire letter.

The CHAIRMAN. Mr. Shonts is coming before us in a few days, and we will ask him for it.

Mr. CROMWELL. I have his permission to use this extract only.

Senator MORGAN. Have you a copy of the whole of it?

Mr. CROMWELL. I have seen the whole of it, but I have his permission only to use this part.

Senator MORGAN. Have you a copy of the whole of it?

Mr. CROMWELL. Yes, sir; I have a copy of the whole letter.

Senator MORGAN. Why do you not produce it?

Mr. CROMWELL. I do not feel at liberty, Senator, to produce it without permission.

Senator MORGAN. Well, I feel at liberty to demand of you that you shall produce it.

Mr. CROMWELL. If the committee orders it, of course I shall do so. It is of no consequence to me.

Senator MORGAN. Mr. Chairman, I move that the witness be required to produce that letter.

The CHAIRMAN. The witness states that he will produce it.

Mr. CROMWELL. With pleasure; I only wish—

Senator MORGAN. And that will go into the record?

Mr. CROMWELL. Yes, sir.

The quotation to which I referred was as follows:

"The business proposition that I have now under consideration is of such an important character and opens out such a wide field for future prosperity to me that I can not possibly see how I would be justified in declining it. My family and those of my friends with whom I have consulted with regard to it have been absolutely a unit in urging me to form the new connection. * * *

"There were so many sides to this matter that I thought it best for the Secretary of War and myself to discuss it in all its features and at length. I also did not feel that it would be fair to the Secretary to let the matter go over until after he had left the country.

"On the other hand, the situation was such that I would have had to let the opportunity go by if it had become necessary to postpone it until his return from the Philippines."

Fourth—these are the four instances in which Mr. Wallace made explanation of his conduct at that time.

Fourth. Five days later, on July 1, 1905, Mr. Wallace issued to the press of the country a carefully prepared defense of his course, a copy of which he has incorporated in his testimony before you, and in which he again states his reasons without alluding to me as a cause of his determination to resign.

On the contrary, after the reorganization of the Commission and the distribution of duties had been approved by Mr. Wallace in the heartiest manner, he left for the Isthmus with his family on the 17th day of May, 1905, with all the powers and honors that he had requested—

Senator MORGAN. Wait a moment, Mr. Cromwell.

Mr. CROMWELL (continuing). And with the view of an indefinite stay there.

Senator MORGAN. Wait a moment. Is it your purpose, in bringing forward this statement in respect to Mr. Wallace, to contradict and impeach him?

Mr. CROMWELL. I am stating facts.

Senator MORGAN. What is your purpose in bringing it forward? You have been asked no questions. What is your purpose in bringing this forward?

Mr. CROMWELL. I am stating facts, Senator.

Senator MORGAN. What is your purpose?

Mr. CROMWELL. The purpose indicated by the facts.

Senator MORGAN. That is to impeach and contradict him?

Mr. CROMWELL. It is to state the facts as they exist, and I suppose the committee desire the facts.

Senator MORGAN. Do you intend to contradict him?

Mr. CROMWELL. If the facts contradict him, he is contradicted.

Senator MORGAN. Do you intend to impeach him?

Mr. CROMWELL. If the facts impeach him, he is impeached. He arrived there on May 24, 1905. He left here May 17. He arrived there on May 24, 1905, and two days after his arrival, and while there had not occurred the slightest communication between us in the interval, he voluntarily wrote to me a letter which so completely contradicts his present statements that I present it in full and which only the circumstances of the case induce me to present:

“ ISTHMIAN CANAL COMMISSION,

“ *Panama, May 26, 1905.*

“ Mr. WILLIAM NELSON CROMWELL,

“ *49 Wall street, New York City.*

“ MY DEAR Mr. CROMWELL: During my restful voyage to the Isthmus on the *Segurança*, while mulling over the various matters connected with our work, my mind repeatedly turned to the words of advice and counsel which I received from you, particularly the conversation which we had at your house, where Mrs. Cromwell and yourself so kindly entertained us the night before our departure.”

The CHAIRMAN. Mr. Cromwell, what is the date of that letter?

Mr. CROMWELL. May 26; two days after he reached the Isthmus.

Senator MORGAN. After he first reached the Isthmus?

Mr. CROMWELL. Yes, sir; after he reached the Isthmus on his last trip, and ten or fifteen days before he returned.

Senator MORGAN. How long was that before the conversation that Mr. Wallace and Secretary Taft had in your presence and with you?

Mr. CROMWELL. How long before, Senator?

Senator MORGAN. How long was that before the conversation that Secretary Taft and you had with Mr. Wallace? I will put it that way.

Mr. CROMWELL. This letter is written on May 26, and the Manhattan Hotel interview was on June 25.

Senator MORGAN. Of the same year?

Mr. CROMWELL. Of the same year. I repeat:

“ During my restful voyage to the Isthmus on the *Segurança*, while mulling over the various matters connected with our work, my mind repeatedly turned to the words of advice and counsel which I received

from you, particularly the conversation which we had at your house, where Mrs. Cromwell and yourself so kindly entertained us the night before our departure.

"The more thought I give the matter the more I am impressed with your words of wisdom, and it is needless for me to say that I will endeavor to carry out the policy outlined.

"In looking back over the events of the past few months I become more and more impressed with the wisdom underlying the action of the President and the Secretary of War, as well as with the wisdom of their 'privy counsel,' and the tactful manner in which matters have been guided through the troubled waters of the sea of complication which has surrounded the situation."

Senator KNOX. Who is the "privy counsel" referred to? Did he refer to you?

Mr. CROMWELL. He meant me, sir.

Senator KNOX. Oh; I did not quite understand it.

Mr. CROMWELL (reading). "While my own manners and methods are, as you know, blunt and direct, my deficiencies in this direction only serve to enhance the appreciation I have of the skilled and polished diplomat who has made this great work a possibility"——

Senator MORGAN. Who was that?

Mr. CROMWELL (reading). "And whose thoughtful care and guiding hand will be the most important factors in the ultimate success of the enterprise."

Senator MORGAN. Who was that?

Mr. CROMWELL (reading). "In closing, permit me, my dear Mr. Cromwell, 'to lift my hat to you.'"

"Sincerely, yours,

JOHN F. WALLACE."

Modesty would forbid me to read this letter, and nothing but the circumstances of the case compels me to do it. [Laughter.]

Senator MORGAN. I trust so.

Mr. CROMWELL. Mr. Wallace has testified before you, at page 448 of your record, that "my final decision was arrived at as the result of the six days' uninterrupted thought which I was able to give the subject in all its bearings during my voyage from New York to Colon in May."

Senator DRYDEN. Was that the voyage?

Mr. CROMWELL. This very voyage.

Senator DRYDEN. Just after which he wrote that letter?

Mr. CROMWELL. Yes, sir; this very voyage.

It is manifest, therefore, that when he wrote this letter to me, two days after his arrival on the Isthmus, he had had "six days' uninterrupted thought," which he was "able to give the subject in all of its bearings," and which letter is totally inconsistent with the explanation he has given to you.

It therefore conclusively appears that he at no time contemporaneous with the event alluded or referred to me as being in any sense whatever the cause for his resignation, and the fact is that I was not in any manner responsible for his resignation.

In conclusion, permit me to state that the only financial interest that either I or any member of my firm or any associate has upon the Isthmus or in the Republic of Panama is a personal investment of mine in the capital stock of the Panama-American Corporation. I subscribed and paid for, at par, \$51,800 in the capital stock of this company, out of a total capital of \$229,000. This company is engaged in

supplying to the inhabitants of the city of Panama electric light, ice, and telephone service; and it is also a minority stockholder in a small ice company in Colon. It is a local and private affair, and my investment was in large part induced by a desire to assist a local enterprise.

I may add that we have not had any dividends.

Senator MORGAN. In the concluding part of your dissertation you refer to testimony given by Mr. Wallace before this committee, at page 448 of the record of these proceedings, in which he states:

"My final decision was arrived at as the result of the six days' uninterrupted thought which I was able to give the subject in all its bearings during my voyage from New York to Colon in May."

Was that the same voyage which terminated his connection with the company?

Mr. CROMWELL. It was.

Mr. CURTIS. That is, the voyage down, Mr. Cromwell?

Mr. CROMWELL. The voyage down—yes, sir. That terminated his connection.

Senator MORGAN. Had you any knowledge of that statement of Mr. Wallace before you had the conversation with him in the presence of Mr. Taft?

Mr. CROMWELL. No, sir.

Senator MORGAN. What was the interval of time between that statement and the conversation that you had with him and Mr. Taft.

Mr. CROMWELL. He has just made the statement before you—a few days ago.

Senator MORGAN. No; I mean the statement he made before you and Mr. Taft.

Mr. CROMWELL. That was on June 25, sir; and he has explained to you that his decision was reached on his voyage to the Isthmus, during this six days of uninterrupted thought.

Senator MORGAN. When was that voyage made to the Isthmus?

Mr. CROMWELL. From May 17 to May 24, 1905, and he left the Isthmus to come back here within two or three days afterwards.

Senator MORGAN. You state this here for the purpose, as you indicate, of showing that his conversation with you and Secretary Taft had no relation to or connection with his final determination to resign from the position he held with the canal?

Mr. CROMWELL. I beg your pardon, Senator; I do not think I understand you.

Senator MORGAN. You state here what I will read:

"It is manifest, therefore, that when he wrote this letter to me two days after his arrival on the Isthmus, he had had the six days' uninterrupted thought which he was able to give the subject in all its bearings, and which letter is totally inconsistent with the explanation which he has given to you."

Mr. CROMWELL. Which he has given to this committee.

Senator MORGAN. Now, point out the inconsistency.

Mr. CROMWELL. His testimony before you is that after six days' uninterrupted thought he had reached the conclusion to resign. He wrote me a letter of compliment and approval and of the character I have read two days after that. He gave to Secretary Taft the explanation that he resigned to accept a better place. He gives to you the explanation that he was in part influenced in that course by me. There lies the inconsistency.

Senator KNOX. Do you know the page of the testimony where he says that you had anything to do with his resigning? Do you happen to have made a note of that, Mr. Cromwell?

Mr. CROMWELL. Let me see. I have not made a note of it, Senator, but I read it.

Senator KNOX. He refers to you quite frequently, but I have been trying to find where he assigned that as a reason. Never mind; I thought possibly you might have noted it.

Mr. CROMWELL. I think it was strung through his testimony. My impression is that it was rather impregnated in the questions than it was embodied in the answers.

The CHAIRMAN. I will give you a copy of Mr. Wallace's testimony for your convenience, if you wish to look the matter up.

Senator KNOX. You need not ask him to do it; I will look it up. That is all, Senator; I only wanted to see about that.

Senator MORGAN. In the course of your many employments, official employments and otherwise, you have resigned places, have you not?

Mr. CROMWELL. Pardon me?

Senator MORGAN. Have you resigned any place in the course of your many employments that you have been engaged in with other people?

Mr. CROMWELL. I do not understand your question, sir.

Senator MORGAN. You have had many engagements with other people, other corporations, other companies, other governments. Have you resigned any of them?

Mr. CROMWELL. I never have had any relation to any government other than the Government of Panama.

Senator MORGAN. Well, we will come to that a little later on. Have you ever resigned any position that you have ever held in connection with any company, corporation, partnership, or government?

Mr. CROMWELL. Why, certainly. Do you mean in my general law practice?

Senator MORGAN. No, sir; I am talking about positions that you have held as an employee or as counsel or as a member of any corporation or company or partnership?

Mr. CROMWELL. Why, certainly; certainly.

Senator MORGAN. You have resigned?

Mr. CROMWELL. Certainly.

Senator MORGAN. Did you feel yourself entirely at liberty to do so?

Mr. CROMWELL. When the circumstances warranted; certainly.

Senator MORGAN. In any resignation that you have made have you consulted the people with whom you had relations as to whether they were willing for you to resign or not?

Mr. CROMWELL. When duty called it; certainly.

Senator MORGAN. You have done such things?

Mr. CROMWELL. Certainly; when duty called it.

Senator MORGAN. What obligation was Mr. Wallace under to inform you and inform Mr. Taft of his reasons for resigning from the chief engineership or from the commissionership at the Isthmus of Panama?

Mr. CROMWELL. I think it would be rather more appropriate for the Secretary of War to answer that question.

Senator MORGAN. Can not you answer it?

Mr. CROMWELL. He surely had no reason to explain it to me.

Senator MORGAN. What obligation was he under to explain it to anybody?

Mr. CROMWELL. That is for the Government to say.

Senator MORGAN. You can not say. Do you know of any obligation that he was under to explain it to anybody?

Mr. CROMWELL. I think he was under obligation, but that is merely my own judgment.

Senator MORGAN. Well, state what you think about it.

Mr. CROMWELL. I think that under the circumstances he was bound to afford the Government fair and ample opportunity to select a successor before retiring.

Senator MORGAN. Did he resign from both positions, as commissioner and as engineer, at the same time?

Mr. CROMWELL. He did not resign in the technical sense of resigning at all. He declared his intention to retire as chief engineer.

Senator MORGAN. At what time?

Mr. CROMWELL. At the Manhattan interview.

Senator MORGAN. No, no; when was he to retire?

Mr. CROMWELL. Practically at once, within the next two or three months; practically immediately.

Senator MORGAN. Did he say so.

Mr. CROMWELL. He said that he would wind up his affairs—occupy himself for two or three months.

Senator MORGAN. In his resignation, did he not offer to continue in the office and in the discharge of the duties of chief engineer at the option and will of the President?

Mr. CROMWELL. Not upon the Isthmus, sir.

Senator MORGAN. Why do you qualify it in that way?

Mr. CROMWELL. Because that is where the work was to be performed.

Senator MORGAN. Do you say that he had a qualification in his resignation that he would work in New York or elsewhere in the United States and not work on the Isthmus?

Mr. CROMWELL. He declared he would not return to the Isthmus as chief engineer.

Senator MORGAN. As chief engineer?

Mr. CROMWELL. Yes, sir.

Senator MORGAN. To whom, and when?

Mr. CROMWELL. At the Manhattan interview to which I have referred.

Senator MORGAN. What about his position as Commissioner? Did he indicate a willingness to hold to that position, to give advice and assistance to the chief engineer that might be appointed to take his place?

Mr. CROMWELL. He indicated that he was willing to act in a general advisory relation if he was—

Senator MORGAN. He did?

Mr. CROMWELL. Yes, sir.

Senator MORGAN. Then his resignation was not positive, abrupt, and conclusive, but it was left to the President to determine whether he would accept it and when he would accept it?

Mr. CROMWELL. It was abrupt and conclusive in the office of chief engineer, in which he was actively serving.

Senator MORGAN. That is not an answer to my question. Was his resignation abrupt or conclusive or final at the time he delivered it to

the President, or did he still offer to serve the Government if the President saw proper to retain him in the service?

Mr. CROMWELL. Not as chief engineer.

Senator MORGAN. Well, as Commissioner?

Mr. CROMWELL. Oh! in any ornamental place, certainly.

Senator MORGAN. Ornamental, was it?

Mr. CROMWELL. I mean to say any convenient place.

Senator MORGAN. Do you regard the position of Commissioner as being ornamental? [Laughter.]

Mr. CROMWELL. I mean any convenient place; any easy service.

Senator MORGAN. Yes.

Mr. CROMWELL. Of course the work of the affair was upon the Isthmus.

Senator MORGAN. Well, you know that Mr. Wallace did not offer to resign finally and immediately as Commissioner?

Mr. CROMWELL. He left that subject open, sir.

Senator MORGAN. Do you know also that he——

Mr. CROMWELL. But he did positively refuse to return to the Isthmus as chief engineer.

Senator MORGAN. Do you know also that he did not offer to resign his office of chief engineer finally and immediately?

Mr. CROMWELL. He announced definitely and distinctly that he retired from the office of chief engineer, and would not return to the Isthmus in that capacity.

Senator MORGAN. Did he do that in the presence of yourself and Secretary Taft?

Mr. CROMWELL. He did, sir; yes, sir; and he stated that he had accepted another and better place at \$65,000 a year.

Senator MORGAN. He stated that he had accepted it?

Mr. CROMWELL. He stated that he had accepted, or agreed to accept, another place involving a fixed salary of \$50,000 with contingencies of \$15,000 more, and that his new employers would permit him to occupy himself for the next month or two in and about the cleaning up and winding up of his canal work, provided it did not involve his return to the Isthmus.

Senator MORGAN. Did he say that he had agreed to accept that employment?

Mr. CROMWELL. He did.

Senator MORGAN. Did he tell you who the people were with whom he had made the contract?

Mr. CROMWELL. He did not.

Senator MORGAN. But did he describe the nature of the service into which he was going?

Mr. CROMWELL. He did, sir.

Senator MORGAN. What was it?

Mr. CROMWELL. He said the place which he was to accept was with a large holding corporation, of which he was to be the head.

Senator MORGAN. Holder of what? What kind of a holding corporation did he describe?

Mr. CROMWELL. He made no further description than that, Senator.

Senator MORGAN. Did it have any connection with railways?

Mr. CROMWELL. He made no further description, Senator, than that.

Senator MORGAN. None whatever?

Mr. CROMWELL. The phrase "holding corporation" by us all is known as being rather the parent corporation that owns the stocks in subordinate companies—allied corporations.

Senator MORGAN. Mr. Wallace stated in his deposition as follows, in reply to a question that I asked him. I said:

"Were you willing at that time to retain your office as Commissioner, giving up your office as chief engineer?"

Mr. Wallace said:

"Yes, sir."

Was that true, according to his expressions at the time?

Mr. CROMWELL. I think substantially true, Senator; not in that precise term, but it was substantially true.

Senator MORGAN. I asked him again:

"Did you so signify to Mr. Taft?"

His answer is:

"Yes, sir. I did not expect my resignation as chief engineer, even, to take effect for several months; but that is what I wanted to discuss."

Was that correct, according to your understanding?

Mr. CROMWELL. No, sir. He announced his conclusions. He did not invite discussion on that point.

Senator MORGAN. He says:

"I did tell the Secretary that I did not want to go back to the Isthmus, you understand. I did not mean that I did not want to go back there at all, but what I meant was that I did not want to go back there as chief engineer."

Mr. CROMWELL. Quite right.

Senator MORGAN. That is correct, is it?

Mr. CROMWELL. He said he would not go back as chief engineer.

Senator MORGAN. But he did not say he did not want to go back to the Isthmus for work or to assist the Government?

Mr. CROMWELL. He simply said that he would not go back as chief engineer, Senator.

Senator MORGAN. That is all he said?

Mr. CROMWELL. And that is what he had been employed for.

Senator MORGAN. Yes.

Mr. CROMWELL. That is what the Government wanted him for.

Senator MORGAN. Well, Mr. Cromwell, as we are into that interview there, where did it occur?

Mr. CROMWELL. It occurred at the Manhattan Hotel, New York City.

Senator MORGAN. At what time of the day and what day?

Mr. CROMWELL. On Sunday, June 25, 1905, at 10 o'clock.

Senator MORGAN. Do you live at the Manhattan Hotel?

Mr. CROMWELL. No, sir.

Senator MORGAN. How did you happen to be there?

Mr. CROMWELL. At the request of Secretary Taft.

Senator MORGAN. Did Secretary Taft tell you at the time he made that request the reasons why he wanted you there?

Mr. CROMWELL. He did.

Senator MORGAN. What were they?

Mr. CROMWELL. The reasons were that he wished me to meet him to confer upon this subject, and also to confer with the vice-president and general manager of the Pacific Mail Steamship Company, Mr.

Schwerin, with whom we were then reaching a very serious climax in our Panama Railroad and Pacific Mail contracts.

Senator MORGAN. Was that officer present at the interview?

Mr. CROMWELL. He was not present at the interview. The interview with him succeeded that interview with Mr. Wallace.

Senator MORGAN. How far apart were they?

Mr. CROMWELL. Half an hour apart only.

Senator MORGAN. At the same place?

Mr. CROMWELL. At the same place.

Senator MORGAN. Did Mr. Wallace remain at that interview?

Mr. CROMWELL. No, sir.

Senator MORGAN. So he wanted to have two interviews, one with Wallace and one with Schwerin?

Mr. CROMWELL. Yes, sir; and we had several interviews.

Senator MORGAN. What was his purpose in having you up there?

Mr. CROMWELL. He had interviews with other gentlemen.

Senator MORGAN. What was the necessity of his having you present at the interview with Mr. Wallace?

Mr. CROMWELL. That is for the Secretary to say. I merely obeyed his request.

Senator MORGAN. So you went there at his request?

Mr. CROMWELL. Solely.

Senator MORGAN. Did you offer to leave?

Mr. CROMWELL. I did.

Senator MORGAN. Who requested you to stay?

Mr. CROMWELL. Secretary Taft.

Senator MORGAN. Had Mr. Wallace called for a private interview with the Secretary?

Mr. CROMWELL. He had called for an interview with the Secretary, in which he wished to express his reasons for retiring.

Senator MORGAN. Did he not tell you when you first approached him on this subject of an interview with the Secretary that he wanted a private interview with him?

Mr. CROMWELL. He did not use the word "private." He said he wanted to state to the Secretary himself his reasons. I informed the Secretary that Mr. Wallace had so expressed himself, and the Secretary said it made no difference to him; he wanted me to be present.

Senator MORGAN. The Secretary, then, refused to have a private interview with him?

Mr. CROMWELL. No, sir; but he requested me to be present.

Senator MORGAN. You had informed the Secretary that Mr. Wallace wanted a personal interview with him?

Mr. CROMWELL. Not particularly a personal interview, but he wished to explain in his own way.

Senator MORGAN. Well, what was that way? What was it?

Mr. CROMWELL. He explained it in his own way.

Senator MORGAN. How?

Mr. CROMWELL. He did explain it in his own way.

Senator MORGAN. Did you not know that Mr. Wallace distinctly requested of you that his interview with the Secretary should be private?

Mr. CROMWELL. Mr. Wallace did not express to me a wish that the interview should be absolutely private.

Senator MORGAN. You use the word "absolutely "

Mr. CROMWELL. Yes, sir.

Senator MORGAN. What do you mean by putting that in there?

Mr. CROMWELL. I mean that he wished to have the opportunity of expressing to Mr. Taft, of course, his views before he expressed them to anybody else.

Senator MORGAN. Yes; before he expressed them to anybody else. Did you not understand that that meant that he wanted to have a personal and private interview with Mr. Taft?

Mr. CROMWELL. Why, I do not think I gave any particular understanding to it. There could be nothing private in an official communication.

Senator MORGAN. Did you not understand at that time that Mr. Wallace wanted to make a personal statement and explanation to Mr. Taft that he did not wish anybody else to participate in?

Mr. CROMWELL. He did make the statement.

Senator MORGAN. Well----

Mr. CROMWELL. He did make the statement.

Senator MORGAN. To Mr. Taft?

Mr. CROMWELL. Certainly.

Senator MORGAN. Did you understand that he wished it to be private?

Mr. CROMWELL. He did not express it to me as being imperatively private. He wished to have the opportunity of expressing it to the Secretary before he expressed it to anybody else.

Senator MORGAN. Did you not understand that he wanted that to be a personal and private interview, at which you were not to be present?

Mr. CROMWELL. Oh, no; he did not say that.

Senator MORGAN. Did you not so understand it?

Mr. CROMWELL. I did not understand that he would have objection to that, and he made no objection to that.

Senator MORGAN. Why, then, did you offer to leave if it was not to be a private interview?

Mr. CROMWELL. Because I felt it would be rather unpleasant and I wished, personally, to escape the interview, to tell the truth.

Senator MORGAN. Why did you feel it was going to be unpleasant?

Mr. CROMWELL. Because of the circumstances surrounding the matter.

Senator MORGAN. State the circumstances.

Mr. CROMWELL. The Secretary had informed me that he had learned from confidential sources that Mr. Wallace had stated on the Isthmus, before leaving, that he intended to accept a better place, and that the Secretary could hardly believe it, did not want to believe it, but that he would withhold his inferences until Mr. Wallace himself disclosed it.

Senator MORGAN. When and where did the Secretary make that statement to you?

Mr. CROMWELL. Here in Washington.

Senator MORGAN. At what time? How long before the interview?

Mr. CROMWELL. Oh, just a few days before.

Senator MORGAN. A few days before?

Mr. CROMWELL. Yes, sir.

Senator MORGAN. Was it after Mr. Wallace had telegraphed for permission to come here?

Mr. CROMWELL. Yes, sir.

Senator MORGAN. How did you happen to be in conversation with the Secretary about that matter?

Mr. CROMWELL. I was not in conversation with him about that particular matter. He mentioned it to me.

Senator MORGAN. When and where?

Mr. CROMWELL. At the War Department.

Senator MORGAN. Did you go there on purpose to have that conversation with him?

Mr. CROMWELL. No, sir. I had no idea of the conversation until it arose.

Senator MORGAN. You knew about his telegram, though?

Mr. CROMWELL. I did not know until then.

Senator MORGAN. Did the Secretary manifest any umbrage or displeasure at Mr. Wallace's alleged statement made on the Isthmus?

Mr. CROMWELL. He expressed surprise and pain.

Senator MORGAN. Did the Secretary inform you who was the confidential agent or friend from whom he had derived that information about Wallace?

Mr. CROMWELL. As the matter was mentioned by him as confidential, Senator, I should feel it to be rather more appropriate that the Secretary himself, who is to testify before you—

Senator KNOX. He has already testified that it was Governor Magoon, Senator; so that need not embarrass you, Mr. Cromwell.

Mr. CROMWELL. Thank you, sir.

Senator MORGAN. Anyone else?

Mr. CROMWELL. He mentioned to me Governor Magoon. I merely wished to—

Senator MORGAN. Did he mention anybody else?

Mr. CROMWELL. No, sir.

Senator MORGAN. And that had produced an unpleasant effect upon his mind?

Mr. CROMWELL. He manifested surprise and disappointment.

Senator MORGAN. What advice did you give the Secretary in regard to that state of feeling that he held toward Wallace?

Mr. CROMWELL. I gave no advice.

Senator MORGAN. You made no observation?

Mr. CROMWELL. Not that I recall.

Senator MORGAN. Can you not tax your mind and remember what you said to him?

Mr. CROMWELL. No, sir; of course not. Conversations of that character—certainly not.

Senator MORGAN. Have you told all that you know of that conversation?

Mr. CROMWELL. I think that is the essence of it.

Senator MORGAN. Was that all the information you had as to the Secretary's feelings toward Wallace before you held the conversation at the Manhattan Hotel?

Mr. CROMWELL. You ask me if that was all the information, sir? I am refreshing my recollection. [After a pause.] I recall that there was exhibited first a cable from Mr. Wallace to the Secretary stating that important business matters required him to come to the United States, and asking the Secretary to make some excuse to send for him; and I recall another cable that the Secretary had sent in reply stating that, although he and Mr. Shonts, the chairman, did not know what

were the reasons for this sudden change, nevertheless they gave him permission to come. Those additional items were before me.

Senator MORGAN. At the time that you went to see the Secretary, which you have just mentioned, when you had the conversation with him in regard to Magoon and Wallace, did you have any other business with him besides that that you have mentioned?

Mr. CROMWELL. Oh, yes, sir.

Senator MORGAN. What was it?

Mr. CROMWELL. Some of these subjects I have already mentioned to you.

Senator MORGAN. What particular business took you from New York to Washington to see the Secretary at that time?

Mr. CROMWELL. The Pacific Mail contract was a matter very acute at that time. We had given notice of the termination of that contract.

Senator MORGAN. Was that the business that took you there?

Mr. CROMWELL. It was.

Senator MORGAN. No other business?

Mr. CROMWELL. Oh, I can not possibly recall the particular subjects of conversation, but I remember that was uppermost in our minds at the time, Senator.

Senator MORGAN. You seem to have a pretty exact memory of matters transpiring in your presence and in connection with you. Now, can you not recall some other subject besides the Pacific mail matter that caused you to go on that occasion to see the Secretary?

Mr. CROMWELL. No, sir. That was a very pressing matter and a burning question.

Senator MORGAN. Why should the Secretary of War confer with you about a matter so delicate as a communication of a confidential nature made to him by Mr. Magoon about Mr. Wallace?

Mr. CROMWELL. I had participated in the preparation of the executive organization of the new Commission, dividing the office duties of the executive committee and the engineering committee.

Senator MORGAN. At whose request did you participate in that?

Mr. CROMWELL. At the request of the Secretary of War. Among other things to harmonize the work of the railroad company with that of the Commission. In the course of that I had become familiar with the plan of reorganization. When Mr. Wallace arrived the Secretary requested me to meet him, they being in New York and I being in New York.

Senator MORGAN. This was after you had had the conversation at the War Department of which I am talking, was it not?

Mr. CROMWELL. No, sir. I am now explaining to you, Senator, why the Secretary spoke with me at this War Department interview.

Senator MORGAN. Was not that before you had the interview at the Manhattan Hotel?

Mr. CROMWELL. Our questions are at cross-purposes, I see.

Senator MORGAN. Well, leave out the purposes and the cross-purposes. I want to get at the facts,

Mr. CROMWELL. So do I.

Senator MORGAN. Was that interview which you had with the Secretary of War about the telegram or cable he had gotten from Mr. Magoon, or the information he had gotten from Mr. Magoon, before or after your interview with Wallace at the Manhattan Hotel?

Mr. CROMWELL. Oh, it was before the Wallace interview, of course.

Senator MORGAN. Very good. So what occurred since does not tend to explain it?

Mr. CROMWELL. I was not explaining since. I was explaining anterior.

Senator MORGAN. Yes; you were explaining your whole attitude toward the Secretary. Now, was there any relation between you and the Secretary of War that would induce or require or justify him in bringing you into his counsels and in informing you that he had received a private cable or private information from Governor Magoon as to Mr. Wallace's intention to resign as chief engineer?

Mr. CROMWELL. Yes, sir; and I started out to tell you by going back a little.

Senator MORGAN. Oh, we do not want to go back; I want to know what existed at the time and before that time—what relation existed between you and the Secretary of War at and before the time of that conversation that justified or required him to bring this delicate subject up and bring it to your attention?

Mr. CROMWELL. Because of my participation in the organization of the Commission; because Mr. Wallace had expressed to me his complete approval of that plan of organization; because Mr. Wallace had stated to me that every part of it was perfect; because he had accepted it in every feature; because he had written me this very letter approving of the plan and of the policy and action of the President and the Secretary of War, and because he knew of all those things he said——

Senator MORGAN. Wait a moment——

Mr. CROMWELL (continuing). He considered that I was so familiar——

Senator MORGAN. Wait a moment. Do not run over the committee, please. Just hold a little bit, and wait for a further question. Did the Secretary of War know of this letter that Mr. Wallace had written you before that interview?

Mr. CROMWELL. He did, sir; I showed it to him.

Senator MORGAN. Yes. Now about the organization that you had assisted in preparing. Was not that all formulated and printed before you had this conversation with Secretary Taft?

Mr. CROMWELL. It was formulated and printed; but before it was formulated and printed I had been consulted in regard to its formulation.

Senator MORGAN. We understand that; but it had been formulated and printed. Did not Secretary Taft have a copy of it?

Mr. CROMWELL. Yes, sir.

Senator MORGAN. Did he not know every feature of that organization?

Mr. CROMWELL. Oh, of course.

Senator MORGAN. Yes. Then how could that be any inducement to him to seek information or advice from you in regard to the resignation of Mr. Wallace?

Mr. CROMWELL. Because of my familiarity with the circumstances under which Mr. Wallace had accepted the position, had adapted himself to the work, and the approval he had expressed of it, the hearty concurrence he had manifested in it, and his letter to me indorsing and agreeing to it.

Senator MORGAN. You have gone over that ground once before, and still you escape an answer to my question. I want to know how it was that a plan of organization formulated, if you please, by yourself—

Mr. CROMWELL. It was not formulated by me.

Senator MORGAN. Well, if you please—

Mr. CROMWELL. I do not please; it was not formulated by me.

Senator MORGAN. I assume that you did all that you could.

Mr. CROMWELL. You need not assume anything of the kind. I did not do it.

Senator MORGAN. Well, how was it that the formulation of that plan, or its being put in type, or its being in the hands of the Secretary of War would offer any inducement to Secretary Taft to communicate to you a delicate message that he had gotten from Governor Magoon in regard to Mr. Wallace's resignation?

Mr. CROMWELL. Because of this absolute change and revolution in the course of Mr. Wallace's conduct, the previous course of which I had been so familiar with, he naturally communicated to me this change, and he inquired of me whether I knew of any circumstance or thing that could possibly have brought about this revolutionary change.

Senator MORGAN. Were you ever consulted by Secretary Taft about any of the other officers down there, in regard to their conduct?

Mr. CROMWELL. No; not particularly, because I had no particular part in the conduct of the other officers.

Senator MORGAN. What particular part had you in the conduct of Mr. Wallace?

Mr. CROMWELL. The knowledge that I have described several times, which you seem to take exception to.

Senator MORGAN. No; I do not take any exception to the knowledge. I will take no exception to any part of it. Now, therefore, you had some particular interest in Mr. Wallace or some particular connection with him that authorized and justified the Secretary of War in making a communication of a delicate piece of information that he had received by cablegram in regard to Wallace from Mr. Magoon? That is the way you put it?

Mr. CROMWELL. I put it as I have put it. I do not put it as you put it.

Senator MORGAN. Well, how do you put it?

Mr. CROMWELL. Shall I state it all over again? Do you wish me to state it all over again?

Senator MORGAN. I would rather not, because there is a great deal that is entirely irrelevant.

Mr. CROMWELL. I think so, too. [Laughter.]

Senator MORGAN. If we can come down to the point, Mr. Cromwell—

Mr. CROMWELL. I will be glad to have you get there.

Senator MORGAN. Well, sir, I will get there in time, if you will stay by me,

Mr. CROMWELL. I will be there. [Laughter.]

Senator MORGAN. I want to know, now, the particular reason, if there was any special reason, why Secretary Taft asked you for any explanation or any information or any advice in regard to this communication he had gotten from Governor Magoon?

Mr. CROMWELL. I will repeat again, sir:

First. Because of my familiarity with Mr. Wallace's acceptance and cooperation in the reorganization.

Second. Because the Secretary knew that I had a large acquaintance on the Isthmus, and desired to know whether I was aware from any source of information from there as to what this sudden change could be attributed to.

Senator MORGAN. Now, will you be good enough to state to this committee, in the words that occurred, the conversation between you and Secretary Taft on that occasion?

Mr. CROMWELL. Oh, I could not do that.

Senator MORGAN. Beginning at the beginning.

Mr. CROMWELL. Oh, I could not pretend to, Senator. It would be quite impossible, sir. I would like to oblige you, but it is quite impossible.

Senator MORGAN. No; you are not obliging me; you are obliging yourself by doing that.

Mr. CROMWELL. It would be quite impossible, sir, to repeat the conversation.

Senator MORGAN. Well, can you recall the conversation?

Mr. CROMWELL. I recall it sufficiently to have given you the substance of it already, sir.

Senator MORGAN. I have not asked for the substance of it on any occasion. I have asked for the conversation.

Mr. CROMWELL. I do not remember any more than that, Senator.

Senator MORGAN. Who introduced the subject of Mr. Wallace and his resignation?

Mr. CROMWELL. The Secretary, I know, referred to it, because I had no previous knowledge of it.

Senator MORGAN. Did he read you the telegram that he got from Governor Magoon?

Mr. CROMWELL. No, sir.

Senator MORGAN. Did you know its contents?

Mr. CROMWELL. Only as he stated to me what he was informed of.

Senator MORGAN. In what words did he indicate that to you?

Mr. CROMWELL. I can not pretend to quote his words. I have given the substance.

Senator MORGAN. You can give the substance of the words by which he indicated that to you.

Mr. CROMWELL. The substance was that he had been informed that Mr. Wallace had decided to accept a better offer and to retire as chief engineer, and was leaving for the United States.

Senator MORGAN. What did you say in reply to that?

Mr. CROMWELL. Why, I expressed words of surprise and disappointment.

Senator MORGAN. In what terms did you express those words of surprise and disappointment?

Mr. CROMWELL. Oh, I would not pretend to quote the language, Senator.

Senator MORGAN. You would not pretend to quote it?

Mr. CROMWELL. Any more than you would pretend to quote one of your own able speeches.

Senator MORGAN. That would be quite a job, particularly those that I have made about the canal and canal matters. [Laughter.]

Mr. CROMWELL. I have read them all, sir, with delight.

Senator MORGAN. Well, I want to give you all the enjoyment I can, and I am going over them again with you to-day, as soon as I feel able to do it. [Laughter.]

Did the conversation about Mr. Wallace terminate with these statements that you have made?

Mr. CROMWELL. Substantially; yes, sir.

Senator MORGAN. It did?

Mr. CROMWELL. I think so.

Senator MORGAN. You think that was all that was said?

Mr. CROMWELL. Yes, sir.

Senator MORGAN. That is all Mr. Taft had told you of Mr. Magoon's dispatch?

Mr. CROMWELL. He did not use the word "dispatch." He simply said he had received information of a confidential character.

Senator MORGAN. Did he say by cable?

Mr. CROMWELL. He did not.

Senator MORGAN. He said from the Isthmus?

Mr. CROMWELL. Yes, sir; from the Isthmus.

Senator MORGAN. At what time did he say he had received it?

Mr. CROMWELL. He did not say.

Senator MORGAN. And that is all you can remember of the conversation?

Mr. CROMWELL. That is all. That was the essence. That is all I ever try to remember of anything.

Senator MORGAN. The essence of it?

Mr. CROMWELL. Yes.

Senator MORGAN. You make a practice of trying to escape the facts and get the essence out of everything that you state as a matter of memory?

Mr. CROMWELL. The facts are the essence. Let us keep to the point, Senator.

Senator MORGAN. In other words, you like to put your own construction on language rather than to recite it as it occurred?

Mr. CROMWELL. I do not, sir; and I will not accept your construction of it, either.

Senator MORGAN. If you do not, then proceed to state what occurred there—the language.

Mr. CROMWELL. I have already answered, sir, that it would be impossible for me to recall the language of an interview of that kind.

Senator MORGAN. So that you are presenting us with the essence instead of the facts?

Mr. CROMWELL. I have presented you with the facts, which are the essence.

Senator MORGAN. How long did you remain there in that interview?

Mr. CROMWELL. It was just a casual interview.

Senator MORGAN. How long did you remain?

Mr. CROMWELL. Oh, I would have no memory, Senator, about the duration of an interview.

Senator MORGAN. Did you stay a day?

Mr. CROMWELL. Oh, no; it was a—

Senator MORGAN. Did you stay an hour?

Mr. CROMWELL. I have no memory, sir, as to the duration of an interview.

Senator MORGAN. Did you stay ten minutes?

Mr. CROMWELL. Probably. Oh, fully.

Senator MORGAN. Fully ten minutes. Is that as far as you can go?

Mr. CROMWELL. It was an interview, Senator, in the course of which many other subjects were spoken of; several subjects, probably, were spoken of.

Senator MORGAN. Were probably spoken of, you say?

Mr. CROMWELL. Yes; we had other topics under discussion.

Senator MORGAN. What subject was spoken of, actually, not probably, besides the one that you refer to?

Mr. CROMWELL. The Pacific Mail matter, particularly.

Senator MORGAN. Did you take it up?

Mr. CROMWELL. Yes, sir. That is the subject in connection with which I had gone there.

Senator MORGAN. You had gone there in connection with that subject?

Mr. CROMWELL. Yes, sir.

Senator MORGAN. And took that up?

Mr. CROMWELL. Yes, sir.

Senator MORGAN. How long did that continue?

Mr. CROMWELL. Oh, I have no memory, sir, of such trifles.

Senator MORGAN. Half an hour?

Mr. CROMWELL. I have no memory of such trifles.

Senator MORGAN. It was an intricate and difficult subject, was it not?

Mr. CROMWELL. The Pacific Mail matter?

Senator MORGAN. Yes.

Mr. CROMWELL. It is a difficult subject; it was a difficult subject.

Senator MORGAN. And was a matter of very serious concern with the Secretary of War?

Mr. CROMWELL. It was a very serious matter for the Government.

Senator MORGAN. You think you discussed that in fifteen minutes?

Mr. CROMWELL. Why, we were not discussing the whole Pacific Mail contract. It was the question of the attitude to be taken toward the Pacific Mail people.

Senator MORGAN. You think you disposed of it in fifteen minutes?

Mr. CROMWELL. I would not venture, Senator, to make any estimate.

Senator MORGAN. Who else was present in any of these interviews?

Mr. CROMWELL. No one.

Senator MORGAN. No one at all?

Mr. CROMWELL. No, sir.

Senator MORGAN. No clerk was present?

Mr. CROMWELL. No, sir.

Senator MORGAN. Was it a strictly private interview between you and the Secretary?

Mr. CROMWELL. It was like all other interviews in his office. Nobody else happened to be around. Clerks were coming in and out, perhaps.

Senator MORGAN. And that was how many days before you met Mr. Wallace at the Manhattan?

Mr. CROMWELL. I do not recall how many days, Senator.

Senator MORGAN. Several days?

Mr. CROMWELL. Several days before.

Senator MORGAN. Six or seven days?

Mr. CROMWELL. Well, I do not recall. It was several days before. I make no record of these interviews.

Senator MORGAN. There are some subjects you seem to treat very lightly.

Mr. CROMWELL. Some subjects are worth treating lightly.

Senator MORGAN. Yes; I know they are. When Mr. Wallace came to New York in response to or under permission of the cablegram that he had from Secretary Taft did you meet him?

Mr. CROMWELL. I met him the day following his arrival; yes, sir.

Senator MORGAN. Did you have someone at the boat to meet him?

Mr. CROMWELL. You are speaking, now, of his last journey?

Senator MORGAN. Yes; the one that took place after this interview with Secretary Taft.

Mr. CROMWELL. No, sir.

Senator MORGAN. You had no one there?

Mr. CROMWELL. I did not meet him at the boat; no, sir.

Senator MORGAN. Did he go to your house?

Mr. CROMWELL. No, sir.

Senator MORGAN. Was he invited to your house?

Mr. CROMWELL. No, sir.

Senator MORGAN. How did you ascertain his arrival in New York?

Mr. CROMWELL. It was known to us all.

Senator MORGAN. Oh, I know. I know a great many people in Alabama, but I do not know whether they are in Washington or not. How did you ascertain his arrival in New York?

Mr. CROMWELL. The officers of the railroad, sir, informed me where he was. He gave his address to them.

Senator MORGAN. He gave his address to them?

Mr. CROMWELL. Yes, sir.

Senator MORGAN. Did you not know of his arrival in New York until the officers of the railroad informed you?

Mr. CROMWELL. Oh, no; no, sir. I had no occasion to.

Senator MORGAN. Did you call on him at his hotel?

Mr. CROMWELL. I did, sir.

Senator MORGAN. What time of the day?

Mr. CROMWELL. In the morning.

Senator MORGAN. How early?

Mr. CROMWELL. Roughly, it was in the morning hour; ten o'clock, perhaps.

Senator MORGAN. Soon after your breakfast?

Mr. CROMWELL. Long after my breakfast, Senator. [Laughter.]

Senator MORGAN. Did you, then, inform him that you had arranged an interview with Secretary Taft?

Mr. CROMWELL. I did not so inform him, but I did inform him this, that Secretary Taft had asked me—I being near by—to call upon him and state that he, the Secretary, was under great pressure for time, as everybody knows; he was then planning to go on this long Philippine trip, and he was under engagement in the meanwhile to make certain addresses at New Haven, at the college commencement; he was to rush to New Haven to attend to that affair in a day or two and hurry back to Washington and leave the day succeeding for the Philippines. Therefore, there would not be the opportunity here, in his hurry, for

a conference; and he suggested, for the convenience of Mr. Wallace, who had just arrived from a long voyage, that it would be an undue tax upon his strength, perhaps, to have him rush over to Washington for a hurried interview, and for the Secretary himself to have to hurry back to New York a few hours thereafter; and he said that he would consult Mr. Wallace's convenience, and be happy to meet him in New York at the Manhattan Hotel or any place for a conference while he, the Secretary, was en route to New Haven, where he was to make his address at the college commencement.

Senator MORGAN. Did you tell all that to Mr. Wallace?

Mr. CROMWELL. I did.

Senator MORGAN. Did you tell him that the Secretary would be happy to meet him in New York?

Mr. CROMWELL. Oh, certainly; and arranged for it. Mr. Wallace expressed himself as much relieved, because it saved him from a hurried trip to Washington. It was purely a call of courtesy and regard, and to make the appointment. Mr. Wallace and I always have been very good friends and very cordial.

Senator MORGAN. Did you think the Secretary was in a very happy mood toward Mr. Wallace when you left Washington on that occasion?

Mr. CROMWELL. I think he was in a very anxious mood.

Senator MORGAN. Was he resentful and indignant?

Mr. CROMWELL. Not at all.

Senator MORGAN. Did he believe what Governor Magoon had said to him?

Mr. CROMWELL. I do not know. You will have to ask him.

Senator MORGAN. You do not know whether he believed it or not?

Mr. CROMWELL. No, sir. He told me that it seemed almost impossible of belief and that he hoped it would not be true.

Senator MORGAN. That it seemed almost impossible of belief?

Mr. CROMWELL. Yes, sir; that Mr. Wallace would retire within a few days after he reached there and on the eve of his (Mr. Taft's) departure for the Philippines.

Senator MORGAN. He was not, then, in a very happy frame of mind about it.

Mr. CROMWELL. I can not describe men's moods, Senator.

Senator MORGAN. I do not see how anybody else is to do it, as you were talking with him.

Mr. CROMWELL. I will state facts, as you desire me to.

Senator MORGAN. Well, state facts, then. State what he said and what he did and how he looked. [Laughter.]

Senator KNOX. He looked well, did he not? [Laughter.]

Senator MORGAN. Go on with your statement of facts. You said you would state facts; now do it.

The CHAIRMAN. As I recall, Senator Morgan, this particular interview you are inquiring about has been gone over by Mr. Cromwell before, fully.

Senator MORGAN. I am asking about the state of mind the Secretary was in at the time Mr. Cromwell met him in Washington.

The CHAIRMAN. I do not know that we did get that. [Laughter.]

Senator MORGAN. No.

(By request, the stenographer read the pending question, as follows:

"Senator MORGAN. Go on with your statement of facts. You said you would state facts; now do it.")

Mr. CROMWELL. I do not know the Secretary's state of mind, and it would be presumptuous for me to pretend to portray it. You must ask him about that yourself.

Senator MORGAN. He is not before us and you are, and you have stated that you would state the facts that indicated what his state of mind was. Now you decline to do it, if I understand you, and yet you conveyed to Mr. Wallace the message from the Secretary that he would be very happy to meet him at the Manhattan Hotel?

Mr. CROMWELL. Yes.

Senator MORGAN. Did you believe that he would be happy to meet him? [Laughter.]

Mr. CROMWELL. Certainly. [Laughter.]

Senator MORGAN. After stating all this to Mr. Wallace at the Manhattan Hotel, the first time you met him after his getting off the ship, did Mr. Wallace inform you that he wanted to have a personal interview with Mr. Taft?

Mr. CROMWELL. He did not state it that way, Senator.

Senator MORGAN. What way did he state it?

Mr. CROMWELL. He said he desired—perhaps I will put it more in this way——

Senator MORGAN. Put it exactly right. Just put it in the way he said it.

Mr. CROMWELL. If I put it, it will be put right, Senator.

Senator MORGAN. Put it in the way that he said it, and then it will be right.

Mr. CROMWELL. I have had a very kindly and friendly feeling for Mr. Wallace——

Senator MORGAN. I have not asked you anything about your friendly feeling for Mr. Wallace.

Mr. CROMWELL. And you do not want to know it?

Senator MORGAN. No; I do not think I do.

Mr. CROMWELL. Very well.

Senator MORGAN. Unless I get it from him.

Mr. CROMWELL. Well, that is the fact. I thought you wanted facts. I was aware, although he did not know it, that he had determined to accept this other place.

Senator MORGAN. You were aware that he had determined that?

Mr. CROMWELL. I was aware from information which the Secretary had given me, and which he in turn had derived from confidential sources upon the Isthmus.

Senator MORGAN. That is the way you became aware of it?

Mr. CROMWELL. Yes, sir.

Senator MORGAN. Very good. Go ahead.

Mr. CROMWELL. And I tried to check Mr. Wallace's determination.

Senator MORGAN. How did you try?

Mr. CROMWELL. By saying to him, in the friendliest way, "Now, my dear Wallace, the air is full of rumors and stories. I hope you will do nothing rash."

Senator MORGAN. Well?

Mr. CROMWELL. And it was then that he replied, "Well, I will state it to the Secretary, as I have concluded to do." That is the substance of what was said.

Senator MORGAN. Is that all that was said?

Mr. CROMWELL. He did not say that he wished to see the Secretary absolutely all alone.

Senator MORGAN. "Absolutely all alone" is a pretty strong expression. Did he say anything about wishing to see the Secretary personally?

Mr. CROMWELL. He said he would explain to the Secretary his reasons. I did not ask him what his reasons were. I did not ask him for his conclusions about it. I knew that already.

Senator MORGAN. Did he say to you that he wanted to explain it to you?

Mr. CROMWELL. He did not. I did not ask him. I knew it already.

Senator MORGAN. Did you tell him that you knew it?

Mr. CROMWELL. I did not.

Senator MORGAN. Did he say to you that he wanted to explain it to you?

Mr. CROMWELL. He did not, and I did not invite it of him.

Senator MORGAN. You did not invite it?

Mr. CROMWELL. No, sir.

Senator MORGAN. Then, his clear statement was that he wanted a personal interview with the Secretary of War?

Mr. CROMWELL. He wanted to meet the Secretary of War, of course. The Secretary of War wanted to meet him, of course.

Senator MORGAN. Not in company with you, but by himself?

Mr. CROMWELL. He did not say so.

Senator MORGAN. He did not say so? Did you not understand it in that way?

Mr. CROMWELL. I did not understand one way or the other about it, except that I was to communicate his wishes to the Secretary, which I did.

Senator KNOX. Did he at any time make objection to your presence?

Mr. CROMWELL. He did not, sir. And I hope that there will be nothing in my statement that will be indicative of any unkind feeling, for there has been nothing but the warmest and most cordial relations between Mr. Wallace and myself. At the interview, when the Secretary requested me earnestly to stay, not only did Mr. Wallace make no objection, either in word or in manner, but he began to address us both in a plain and natural manner; and he, moreover, at the conclusion of that most painful incident, came around the table, and with his eyes dimmed—as I confess were mine, as well—grasped my hand, and we shook hands good-by. And I said, with absolute sincerity, "I am deeply moved and sorry over this."

Senator MORGAN. We do not want any sermons about it. We want the facts.

Mr. CROMWELL. These are facts.

Senator MORGAN. Was Mr. Wallace's son present when you reached his room with the Secretary?

Mr. CROMWELL. The Secretary and I were engaged upon these other subjects when Mr. Wallace came in with his son.

Senator MORGAN. His son came with him?

Mr. CROMWELL. He did.

Senator MORGAN. Did he retire immediately?

Mr. CROMWELL. After a few exchanges of greetings, commonplace remarks, I mean, he did.

Senator MORGAN. He went out voluntarily?

Mr. CROMWELL. He retired. I do not know why he came. He had not been invited.

Senator MORGAN. Mr. Wallace swore, on page 466 of this record: "And, knowing that the interview was to be a private one, he withdrew." [Speaking of his son.] "Mr. Cromwell made a pretense of leaving the room, when the Secretary said: 'Cromwell, I want you to stay here. I want you to hear all this.' And he was directed to remain."

Is that true?

Mr. CROMWELL. It is all true except the word "pretense," which is incorrect.

Senator MORGAN. Then I asked this question: "What was the first remark the Secretary made to you?" And Mr. Wallace's answer was: "He said: 'Now, Wallace, go ahead and tell what you came up here for.' I do not remember the exact words, but that is my recollection of it now."

What do you say about that? Did that occur?

Mr. CROMWELL. Substantially, I think that is correct, sir.

Senator MORGAN. Then I asked the question: "Had you left the Isthmus without permission?" To which he replied: "No, sir; I had cabled him for permission to come. * * * And in order that it should not attract any public attention until after I had seen him I sent that cablegram to him in the confidential War Department cipher, that only the governor had down there. I borrowed his cipher, so that the clerks would not know what was in the cablegram, and Mr. Seager, my secretary, who is with me now, and myself together prepared the cablegram which I sent to him, asking him for permission to come to the States to have a conference with him."

Is that the way the Secretary of War spoke to you about that cablegram—that he asked permission to come to the States to have a conference with him?

Mr. CROMWELL. The cablegrams, sir, are in the record, are they not?

Senator MORGAN. No; I do not think they are. I do not remember. Then, further, I asked him, "What was the reply to that?" And Mr. Wallace responded, "The reply to that was that the Secretary of War and Mr. Shonts, not knowing any reason why I should come to the States, nevertheless consented—practically a consent under protest—and it was signed 'Edwards.' He was the head of the Insular Bureau. I have here copies of these cablegrams, if you want them." They do not seem to have been set out in the record.

Mr. CROMWELL. I think they had better be obtained.

Senator MORGAN. Yes; I will have them put in the record. [Reading from record:]

"Senator MORGAN. Then the first request of the Secretary was that you go ahead and tell why you came up?

"Mr. WALLACE. Yes, sir."

Senator MORGAN. Is that so?

Mr. CROMWELL. In substance, yes, Senator. Would you like to have me tell you how it occurred?

Senator MORGAN. Of course I would, exactly.

Mr. CROMWELL. I shall be happy to tell you.

Senator MORGAN. Tell exactly how it occurred and what was said by each of the parties.

Mr. CROMWELL. I never attempt to give a conversation.

Senator MORGAN. I do not want it unless you can state it correctly.

Mr. CROMWELL. Well, then, I shall not tax your time, because I have something else to do in this life besides recording phonographically the exact words of every casual conversation.

Senator MORGAN. Such conversations as this are capital.

Mr. CROMWELL. I never mistake the facts.

Senator MORGAN. The words of a conversation such as this are facts of the most important character. The words themselves are the facts. [Reading from record:]

"Senator MORGAN. Did you proceed to tell him?

"Mr. WALLACE. I told him that I had two matters to take up with him, one of a personal nature and the other general."

Senator MORGAN. Was that so?

Mr. CROMWELL. Right.

Senator MORGAN. That is a fact?

Mr. CROMWELL. Yes, sir.

Senator MORGAN (continuing reading). "The personal matter concerned my connection with the work as chief engineer, and the general matter concerned the general statement that I wanted to make to him in regard to the work."

You have said that that was so. [Continuing reading:]

"Senator MORGAN. Did Cromwell stay while you were discussing both these propositions, the personal and the general one also?

"Mr. WALLACE. Yes, sir."

Did you stay while he discussed both of them?

Mr. CROMWELL. Certainly.

Senator MORGAN. Now, Mr. Cromwell, knowing that Mr. Wallace had declared that he had a personal matter that he wanted to talk over with the Secretary, why did you stay? As a gentleman and a man, why did you stay?

Mr. CROMWELL. Because the Secretary requested me to.

Senator MORGAN. Did he request you to?

Mr. CROMWELL. Absolutely. Mr. Wallace says so.

Senator MORGAN. Then, at the Secretary's request, you stayed, against Mr. Wallace's wishes?

Mr. CROMWELL. No. Mr. Wallace concurred in the wish, by proceeding with the interview.

Senator MORGAN. How do you know that he proceeded to state all that he wanted to state to the Secretary?

Mr. CROMWELL. Well, he had the opportunity to do so.

Senator MORGAN. He had the opportunity, yes. How did it happen, then, knowing that Mr. Wallace had requested a conversation of a personal character with the Secretary of War in regard to personal relations or personal matters, that you found it consistent with your own sense of personal duty to obey the order of the Secretary of War to stay while he was discussing a personal proposition?

Mr. CROMWELL. It was not personal in that sense, sir. Nothing could be personal that concerned his relations to the Government. It was a personal explanation of why he was severing his relations.

Senator MORGAN. Well, that was personal to him?

Mr. CROMWELL. It is not personal to the Government.

Senator MORGAN. It was personal to him, though?

Mr. CROMWELL. Not personal to the Government.

Senator MORGAN. It was personal to him?

Mr. CROMWELL. Not personal to the Government.

Senator MORGAN. It was personal to him. [Laughter.] Was it not?

Mr. CROMWELL. It was his duty to explain to the Government why he personally severed his relations, if you want to put it that way.

Senator MORGAN. And did you put yourself in the attitude of the Government, so that it was a part of your right to hear it?

Mr. CROMWELL. I had been put in that attitude by the request of the Secretary.

Senator MORGAN. You had been put in the attitude of the Government, so that it was your right to hear it?

Mr. CROMWELL. Solely. It was no personal interest of mine; no personal concern of mine; and it was a very painful experience for me to listen to.

Senator MORGAN. (Reading from record:)

"Senator MORGAN. Did Cromwell stay while you were discussing both these propositions, the personal and the general one also?"

"Mr. WALLACE. Yes, sir."

You admit that?

Mr. CROMWELL. Certainly, sir.

Senator MORGAN. (Reading from record:) "Did you invite him to stay?" And he answered: "No, sir."

Did he invite you to stay?

Mr. CROMWELL. Who?

Senator MORGAN. Mr. Wallace.

Mr. CROMWELL. Of course he did not; no, sir. But he proceeded with the interview, addressing us both.

Senator MORGAN. (Reading from record:)

"Senator MORGAN. Did you protest against his staying?"

"Mr. WALLACE. I did not protest, because when I told him freely and went to such an extent in my interview with him, telling him that I wanted the interview to be a private and personal one, I thought that was sufficient. I presume, looking back at it now, that I ought to have remonstrated. But I was impressed with the fact that the Secretary was angry, and that he was suppressing his feelings; and, of course, until my resignation was handed in and accepted, I felt that I was his subordinate, and I did not want to precipitate any unpleasant features in the controversy, which I was impressed was going to be unpleasant anyway, from his attitude. Therefore, I simply let it go along on that basis; but it changed my entire attitude, naturally, from the beginning."

Does that, Mr. Cromwell, describe the condition that the Secretary of War was in?

Mr. CROMWELL. No, sir; it does not.

Senator MORGAN. What was his condition?

Mr. CROMWELL. One of great dignity and calmness.

Senator MORGAN. Indignity and calmness?

Mr. CROMWELL. Great dignity and calmness.

Senator MORGAN. I thought you said "indignity." [Laughter.]

Did Mr. Wallace, in that interview, proceed to state his reasons for desiring to be relieved from his duties as engineer on that Isthmian Canal?

Mr. CROMWELL. He did.

Senator MORGAN. State, just in his language, as nearly as you can, exactly what he said.

Mr. CROMWELL. He stated that after arriving on the Isthmus he had received a cable offer of an engagement as the head of a large holding corporation at a salary of \$50,000 a year; that he had delayed his response to it a few days, and in the interval the parties had increased their offer to the equivalent of \$15,000 more, which would be represented by his opportunity to participate in a pecuniary way in the business; that it was too good an offer for him to lose, and one which he had never hoped to be able to receive until perhaps the very completion of his ten years' work in the canal, and that now there had come a moment, an opportunity which anticipated that long period; that his family all concurred in insisting that he must accept it, and that he had decided to do so; that his prospective employers, those with whom he was concluding the arrangement, would permit him to wind up his canal work for a month or two, provided it did not call him back to the Isthmus as chief engineer. That is the truth.

Senator MORGAN. That is all he stated?

Mr. CROMWELL. Not all that he stated, but that is the reason he gave.

Senator MORGAN. Well, was that the whole of it?

Senator KITTREDGE. Was it the substance of his conversation?

Mr. CROMWELL. Yes, sir.

Senator MORGAN. No. I am not asking for the substance. I am asking for facts, statements—what the man said.

Mr. CROMWELL. During all of that statement by Mr. Wallace, I declare that he was not interrupted nor interrogated. Mr. Wallace made his statement without interruption; in painful silence.

Senator MORGAN. Painful what?

Mr. CROMWELL. Painful silence.

Senator MORGAN. How was it painful?

Mr. CROMWELL. Painful to hear.

Senator MORGAN. To hear what?

Mr. CROMWELL. What he said; the conclusion that he had reached.

Senator MORGAN. Why was it painful?

Mr. CROMWELL. It was painful to have relations severed with a gentleman with whom we had been working, and who, but a few weeks before, almost a few days before, had concurred in everything, accepted every relation, and returned to the Isthmus to do the work which was pressing and of tremendous import. We were approaching the fever period, and the work, as we all now know, was in a condition requiring a supreme head.

Senator MORGAN. In whose hands did he leave that work?

Mr. CROMWELL. The work was left in the charge of subordinates.

Senator MORGAN. Who?

Mr. CROMWELL. Mr. Dauchy was the chief.

Senator MORGAN. How long had he been on the Isthmus?

Mr. CROMWELL. I do not know, sir.

Senator MORGAN. How long had he occupied the second position to Mr. Wallace?

Mr. CROMWELL. I do not know, sir.

Senator MORGAN. What sort of an engineer was he?

Mr. CROMWELL. He was a good engineer.

Senator MORGAN. What sort of a business man was he?

Mr. CROMWELL. I understand that he is a man of fair capacity. One should speak well of him, but he is not a man of the rank of Mr. Wallace.

Senator MORGAN. What do you mean by rank?

Mr. CROMWELL. Engineering rank and position.

Senator MORGAN. Reputation, you mean?

Mr. CROMWELL. He was not the man to put in charge of the work there.

Senator MORGAN. He was competent, as far as you know, in all respects to carry on the work?

Mr. CROMWELL. I know nothing of his competency other than that he is regarded as an engineer of fair working ability. With no disrespect, I may say that he is not an engineer of the first rank and he does not pretend to be.

Senator MORGAN. Do you rank him according to his salary or according to his knowledge?

Mr. CROMWELL. Both.

Senator MORGAN. He did not have a big salary, and you do not know how much knowledge he had? Now, was there any delay, interruption, or disadvantage to the work in consequence of Mr. Wallace's coming away from there before his place was supplied by another chief engineer?

Mr. CROMWELL. I can not answer those questions, sir. They are of a practical character, and I have no duty or responsibility regarding them.

Senator MORGAN. If there was anything of that sort, you do not know anything about it?

Mr. CROMWELL. I have no duty regarding that subject, sir.

Senator MORGAN. You have no duty regarding that subject?

Mr. CROMWELL. No, sir.

Senator MORGAN. Have you any duty in regard to any other subject about the conduct of the canal business?

Mr. CROMWELL. I have no duty about that subject, sir.

Senator MORGAN. You have not had at all at any time?

Mr. CROMWELL. No, sir.

Senator MORGAN. Not at all?

Mr. CROMWELL. No, sir.

Senator MORGAN. How long was it after Mr. Wallace left there before a chief engineer was appointed to take his place?

Mr. CROMWELL. By great good fortune, if not Divine providence, the President was able to find a thoroughly competent engineer quickly and unexpectedly.

Senator MORGAN. Who was that?

Mr. CROMWELL. That was Mr. John F. Stevens.

Senator MORGAN. How long was it before Mr. Stevens got on the Isthmus?

Mr. CROMWELL. I do not know the date of his departure, but his appointment was very prompt, and the opportunity for his appointment arose under these circumstances—

Senator MORGAN. I do not care about going into that.

Mr. CROMWELL. I do. Mr. Stevens had been appointed, after a selection ranging all over the country, picking out the best men possible, as the engineer of the Philippine Commission, in connection with the Philippine—

Senator MORGAN. We have all that statement and history here.

The CHAIRMAN. We have his testimony.

Senator MORGAN. Would you, in courtesy to the committee, omit stating facts that you are not required to state here, and that are not relevant?

Mr. CROMWELL. I thought it would be courtesy to the committee to give them information—

Senator MORGAN. We love to hear you nearly as much as you do yourself; but at the same time we have not the leisure.

Mr. CROMWELL. I thought you would like to hear about it.

Mr. Stevens was appointed engineer of the Philippine Commission, about to sail for the Philippines, and it was on account of that fact that the President was able to switch him off from the Philippine Commission, overnight, almost, to the Panama business.

Senator MORGAN. Was that the Providential interference that you spoke of?

Mr. CROMWELL. I think it was.

Senator MORGAN. Let us get down to the mundane facts and get this case in the hands of the committee instead of in the hands of Providence or the Almighty. Can you state how long it was after Mr. Wallace sent his resignation in before Mr. Stevens was appointed?

Mr. CROMWELL. I can not. The record will show.

Senator MORGAN. What record?

Mr. CROMWELL. The record of the Department.

Senator MORGAN. Have you any idea how long it was?

Mr. CROMWELL. Yes, sir; I think it was within a week or two.

Senator MORGAN. Within that period of time was there any damage or interruption sustained in Panama in regard to the canal work by the absence of the chief engineer?

Mr. CROMWELL. I do not know, sir.

Senator MORGAN. You do not know?

Mr. CROMWELL. No, sir.

Senator MORGAN. You do not know when Mr. Stevens got there?

Mr. CROMWELL. We can supply the date for you. It is very easy to obtain.

Senator MORGAN. Mr. Shonts was appointed when, as president of the Board?

Mr. CROMWELL. I do not recall the date, Senator.

Senator MORGAN. In what year was he appointed?

Mr. CROMWELL. You can easily get the record. It is in the record.

Senator MORGAN. I know. But what year was it? I want to test your memory about it.

Mr. CROMWELL. It was in April. I think it was in April last.

Senator MORGAN. Before the arrival of Mr. Wallace?

Mr. CROMWELL. I am quite sure it was in April. It was either in March or April, I know.

Senator MORGAN. Before the arrival of Mr. Wallace in May?

Mr. CROMWELL. Yes, sir; it was in March or April, I am sure.

Senator MORGAN. How long before Mr. Shonts went down there?

Mr. CROMWELL. I do not know, sir.

Senator MORGAN. Do you not know that it was some months before?

Mr. CROMWELL. I do not know anything about it. I do not recall precisely.

Senator MORGAN. Would not the general work on the canal be apt to suffer from Mr. Shonts's absence as president of that Commission and general manager of the work as it would in consequence of the absence of Mr. Wallace for two or three weeks?

Mr. CROMWELL. I do not know whether it would or not.

Senator MORGAN. You spoke awhile ago of a "painful silence" which occurred. Was that occasioned by any conduct of Mr. Wallace?

Mr. CROMWELL. It was occasioned by the action of Mr. Wallace.

Senator MORGAN. When?

Mr. CROMWELL. The action of Mr. Wallace in the announcement which he was making.

Senator MORGAN. On that occasion or before that time?

Mr. CROMWELL. In the announcement that he was making.

Senator MORGAN. That he intended to resign, or desired to resign?

Mr. CROMWELL. Yes, sir; that he was retiring; that he had accepted another place and was retiring.

Senator MORGAN. Well, was there any man in the Isthmian Canal employment that did not have the same right to announce his retirement?

Mr. CROMWELL. That is not for me to argue or to state, Senator.

Senator MORGAN. You do not want to answer that?

Mr. CROMWELL. It is not my affair.

Senator MORGAN. I was trying to see if I could ascertain some reason why it was so painful and so disastrous to the work that Mr. Wallace should make up his mind that he wanted to quit. Can you state any?

Mr. CROMWELL. I can state why it was painful.

Senator MORGAN. Well?

Mr. CROMWELL. I have already stated it; that it was a very painful experience for a man with whom we had most pleasant associations, who had grasped the hand of each of us only a few days before, expressed the deepest satisfaction and gratitude for the honors which had been given to him, who had dined at my home the night before his departure as my guest, and whom I had seen at the steamer the next day and bade goodbye, to have him write me the letter of May 26 to which I have referred, and then have him turn up within two or three weeks afterwards, throwing up this job and leaving the Secretary and the President, on the eve of the Secretary's departure for the Philippines for three long months, in this perplexity and uncertainty, with the fever season coming on, with the work uncertain, and with no man of power or position in command.

Senator MORGAN. That was all very painful?

Mr. CROMWELL. That made, of course, a painful impression.

Senator MORGAN. You had Doctor Gorgas down there to chase the mosquitoes around and coop them up? [Laughter.]

Mr. CROMWELL. It does not seem to be as painful to you, Senator, as it does to us.

Senator MORGAN. I am afraid not. I am not as sensitive as you are.

Mr. CROMWELL. I have not your honors nor your years.

Senator MORGAN. You had Doctor Gorgas down there to take care of the health situation.

Mr. CROMWELL. Yes, sir.

Senator MORGAN. Mr. Stevens could not help him much about that?

Mr. CROMWELL. He could, vastly.

Senator MORGAN. How?

Mr. CROMWELL. Vastly.

Senator MORGAN. How could he help him?

Mr. CROMWELL. In the cooperative work.

Senator MORGAN. Mr. Wallace could have helped him much?

Mr. CROMWELL. Vastly.

Senator MORGAN. Did he not do all that Mr. Gorgas required of him or asked of him?

Mr. CROMWELL. I do not know. I am stating what could be done.

Senator MORGAN. You are stating what could be done?

Mr. CROMWELL. Yes.

Senator MORGAN. Have you ever heard of Doctor Gorgas complaining that Mr. Wallace had not made ample provision for his sanitary work on the Isthmus?

Mr. CROMWELL. I have no information about that.

Senator MORGAN. So that as to the sanitary conditions, so far as you know, they were not changed for the worse by Mr. Wallace's resignation?

Mr. CROMWELL. I make no comment, for I have no information regarding the effects upon the Isthmus of Mr. Wallace's resignation.

Senator MORGAN. You have no knowledge that they were changed for the worse by the resignation of Mr. Wallace?

Mr. CROMWELL. I have no knowledge upon the subject, sir.

Senator MORGAN. As to the engineering and the conducting of the work, was that any the worse in consequence of Mr. Wallace's resignation?

Mr. CROMWELL. I have no knowledge, Senator, upon that subject. Others are more competent to inform you than I.

Senator MORGAN. The painfulness of which you are making such a demonstration—

Mr. CROMWELL. Why do you call it a "demonstration?"

Senator MORGAN. What you have been doing here.

Mr. CROMWELL. Who do you call it a demonstration?

Senator MORGAN. When you put me on the stand I will answer your questions.

Mr. CROMWELL. I wish I could.

Senator MORGAN. I do not wish to take you here as a subject of comment before this committee. I shall deal with you in the Senate when the facts come out.

Mr. CROMWELL. I have no doubt that is a safe place to do it, sir.

Senator MORGAN. Referring to all this explanation, I will say, instead of "demonstration," that you have just been making to the committee of that painfulness, that situation, what part of all that solicitude or depression occurred in your heart and in your mind from the fact that something was being neglected on the Isthmus that ought to have been done? Anything?

Mr. CROMWELL. I was grievously disappointed that a change was taking place and that an interruption, of course, must follow.

Senator MORGAN. If the change was for the better, would not that be a relief to you?

Mr. CROMWELL. We did not know it would be for the better.

Senator MORGAN. Well, it did occur that Mr. Stevens was put in there, this man that you said Divine Providence selected; that was for the better, was it not?

Mr. CROMWELL. I am not making any comment upon that, sir.

Senator MORGAN. I want to get you to make some.

Mr. CROMWELL. As to whether it was better or not? I am giving no opinion upon that.

Senator MORGAN. When the President turned the old Commission out of office and put in the new one, was that change for the better?

Mr. CROMWELL. I have no opinion to express upon that subject.

Senator MORGAN. None whatever? A change, if it turned out to be for the better, or was intended to be, ought not to harass a gentleman, ought it, who is connected sentimentally, and only sentimentally, with the work?

Mr. CROMWELL. It was a very sad thing, sir, to see a man throw away a great opportunity—

Senator MORGAN. Oh, you were suffering from a sense of pity toward Mr. Wallace?

Mr. CROMWELL. I have the deepest regret that Mr. Wallace would throw away such a magnificent opportunity to achieve imperishable fame.

Senator MORGAN. Those are great things; very great things.

Mr. CROMWELL. They are to some men. To some men they are nothing.

Senator MORGAN. But Mr. Wallace was still at liberty to throw them away if he wanted to?

Mr. CROMWELL. He was, sir; but he had no right to throw away the interests of his Government.

Senator MORGAN. Ought that to excite any anger or solicitude on the part of Secretary Taft?

Mr. CROMWELL. It ought to excite solicitude.

Senator MORGAN. Was it your feeling and Secretary Taft's feeling at the time you had that interview with Mr. Wallace that he was making a goose of himself, or making a fool of himself by throwing away a great opportunity, or was it your feeling that he was doing a wrong to the work?

Mr. CROMWELL. I beg to be excused from describing my feelings. Those are not facts.

Senator MORGAN. You have given them out here so profusely that I supposed you would have no objection to describing them.

Suppose Mrs. Wallace, the wife of Mr. Wallace, had requested him to quit that service; would you think that was a sufficient justification for this pain that you felt?

Mr. CROMWELL. You must excuse me from dealing with hypothetical questions.

Senator MORGAN. I must excuse you? Well, I think I will.

Mr. CROMWELL. It is serious enough to deal with an actual condition.

Senator MORGAN. Yes.

Mr. CROMWELL. I should think if the wife of any general in battle should cause him to desert his task and run home, that it would not be a condition worthy either of emulation or of your support.

Senator MORGAN. But he had permission to come?

Mr. CROMWELL. He had permission to come to state what he wanted to state.

Senator MORGAN. How do you know it was limited to that?

Mr. CROMWELL. That is what was said in the cablegram.

Senator MORGAN. He had permission to come.

Mr. CROMWELL. Because he sought permission to come.

Senator MORGAN. Was any battle going on down there then?

Mr. CROMWELL. The battle is going on, and your records show it.

Senator MORGAN. What sort of a battle was it.

Mr. CROMWELL. Your records show best what sort of a battle.

Senator MORGAN. What is your idea about it?

Mr. CROMWELL. The duty of carrying forward that great work without interruption, without higgings, without jealousies, without bickerings, to carry forward to a successful consummation that great work; that was the duty upon Mr. Wallace's shoulders, and that is the duty upon every man connected with this affair.

Senator MORGAN. Was not that the business of all the Commissioners, also?

Mr. CROMWELL. Every one of them.

Senator MORGAN. Why were they not down there?

Mr. CROMWELL. My dear sir, I can not answer that question.

Senator MORGAN. Were any of them there besides Governor Magoon?

Mr. CROMWELL. Governor Magoon was on the Isthmus.

Senator MORGAN. Was there any Commissioner there besides him?

Mr. CROMWELL. No, sir. That is all the more reason why he should not have left.

Senator MORGAN. Have you suffered as painfully from the absence of the Commissioners as you have in regard to Mr. Wallace's absence?

Mr. CROMWELL. I did not suffer from Mr. Wallace's absence, sir.

Senator MORGAN. You did not?

Mr. CROMWELL. No, sir.

Senator MORGAN. I misunderstood you, then.

Mr. CROMWELL. You could not have misunderstood me.

Senator MORGAN. I did.

Mr. CROMWELL. I beg pardon for putting it in that form, then; but I will say that the language I employed was not capable of that interpretation.

Senator MORGAN. Perhaps I have not the sense to see it; but it is very clear to me.

Mr. CROMWELL. I felt the humanity of the case. You may not understand it, but I feel the very deepest pain over this incident. It was a very painful one.

Senator MORGAN. Why should you feel such solicitude and such pain about this thing, more than any other American citizen? You are not an officer of that company?

Mr. CROMWELL. Mr. Wallace was a personal friend of mine.

Senator MORGAN. Oh; he was a personal friend? You are suffering, then, on account of Mr. Wallace's folly, as a personal friend?

Mr. CROMWELL. He is a personal friend of mine; and he writes me a letter which is so fulsome that I have been ashamed to read it to you.

Senator MORGAN. Are you in the habit of calling letters written by your personal friends fulsome, and being ashamed to read them?

Mr. CROMWELL. I seldom read personal letters to anybody. This has become a business affair.

Senator MORGAN. You brought this forward, notwithstanding it was so painful and so shameful, and so fulsome.

Mr. CROMWELL. I did not say shameful.

Senator MORGAN. You did not say "shameful?" I will take that out, and say "painful and fulsome."

Mr. CROMWELL. I did not say the letter was painful.

Senator MORGAN. What did you say?

Mr. CROMWELL. I said the letter was fulsome. I said the interview was painful.

Senator MORGAN. Do you know any other American citizen not connected with the Isthmian Canal Company or the work there that has suffered these great mental grievances in regard to Mr. Wallace's attitude to the degree and depth that you have? Please name him.

Mr. CROMWELL. Such a question, sir, can not be answered.

Senator MORGAN. Can not be answered? Well, if you can not answer it, I am sure I can not.

What relationship have you to this canal, or the work on it, or the conduct of the business, or the Canal Commission, that entitles you to be so closely connected in your feelings with the resignation of Mr. Wallace and in respect of the Divine interposition in the appointment of Mr. Stevens? What is that connection of yours with this company that justifies you in those expressions?

Mr. CROMWELL. I have described it already. I think I have adequately described it already.

Senator MORGAN. You think you have answered that sufficiently? Well, I suppose you have.

Before I came into the Senate to-day a Senator, a gentleman of prominence, handed me some questions which he asked me to submit to you, and I told him that I would do so. So I will change the subject long enough and far enough to get answers from you to these questions.

When were you first employed by the New French Panama Canal Company?

Mr. CROMWELL. In 1896, sir.

Senator MORGAN. What day of the month?

Mr. CROMWELL. In June, I think. I can find out for you.

Senator MORGAN. Where did that employment take place?

Mr. CROMWELL. In New York City.

Senator MORGAN. With whom did you make it?

Mr. CROMWELL. With the new company.

Senator MORGAN. With what person?

Mr. CROMWELL. With Mr. Whalen.

Senator MORGAN. What office did he hold in the company?

Mr. CROMWELL. He was vice-president of the Panama Railroad Company.

Senator MORGAN. Was your contract with the company or with Mr. Whalen?

Mr. CROMWELL. Oh, with the company, of course; I have no contract with the company. My retainer was by the canal company.

Senator MORGAN. Your retainer?

Mr. CROMWELL. My retainer was from the canal company; yes, sir.

Senator MORGAN. Was that in writing?

Mr. CROMWELL. No, sir; Mr. Whalen communicated to me—

Senator MORGAN. Was it all verbal?

Mr. CROMWELL. Yes, sir.

Senator MORGAN. No record has been made of it?

Mr. CROMWELL. There was no occasion to make any.

Senator MORGAN. Have you ever held a power of attorney from the company?

Mr. CROMWELL. No general power; no, sir.

Senator MORGAN. I did not say a general power.

Mr. CROMWELL. I remember that they once gave me a power to conclude some agreement with the Secretary of State here, which I filed with the Secretary of State.

Senator MORGAN. You filed it with the Secretary of State?

Mr. CROMWELL. Yes, sir.

Senator MORGAN. About what was the date of that?

Mr. CROMWELL. Oh, about—I can give you the date, sir, easily.

Senator MORGAN. What is your best recollection of the date?

Mr. CROMWELL. 1903, I think sir.

Senator MORGAN. That was a special power of attorney?

Mr. CROMWELL. Yes, sir.

Senator MORGAN. Have you held others?

Mr. CROMWELL. No, sir.

Senator MORGAN. Not any others at all?

Mr. CROMWELL. No other powers; no, sir.

Senator MORGAN. With the exception of that single power of attorney, which, of course, was in writing and properly executed and attested, and your general retainer, which was verbal, you have stated the whole scope of your employment by the New Panama Canal Company?

Mr. CROMWELL. Oh, no. I made annual trips to Paris—almost annual trips to Paris—in conference with the directors there, for several years—five or six occasions.

Senator MORGAN. On any of those trips did you receive powers of attorney from them?

Mr. CROMWELL. No, sir.

Senator MORGAN. Did you receive letters of instruction from them?

Mr. CROMWELL. Oh, yes; certainly.

Senator MORGAN. Many?

Mr. CROMWELL. Instructions? Certainly.

Senator MORGAN. Have you got those letters yet?

Mr. CROMWELL. Probably.

Senator MORGAN. What were the terms of your retainer?

Mr. CROMWELL. There was no fixed engagement—I mean to say, no fixed compensation.

Senator MORGAN. Was there any agreement as to the amount of payment?

Mr. CROMWELL. None at all.

Senator MORGAN. Or when to be made?

Mr. CROMWELL. When to be made?

Senator MORGAN. Yes. When?

Mr. CROMWELL. Certainly; upon the consummation of my service.

Senator MORGAN. Upon the consummation of it?

Mr. CROMWELL. Yes, sir.

Senator MORGAN. And not before?

Mr. CROMWELL. My service has been consummated.

Senator MORGAN. I am not asking you that. You say it was upon the consummation of that service. I ask you if it was not before. No payments were to be made before the consummation of your service?

Mr. CROMWELL. There were payments made during the service, certainly.

Senator MORGAN. What was the agreement?

Mr. CROMWELL. There was no agreement. Payments were made during the service, certainly.

Senator MORGAN. Were you employed under a resolution of the board of directors of the New Panama Canal Company?

Mr. CROMWELL. Certainly.

Senator MORGAN. What was that resolution? Give the substance of it.

Mr. CROMWELL. Oh, I do not know. It just communicated the fact that I was appointed.

Senator MORGAN. Was that all?

Mr. CROMWELL. Yes, sir.

Senator MORGAN. It did not state the business for which you were appointed?

Mr. CROMWELL. No, sir.

Senator MORGAN. Where were you to be counsel?

Mr. CROMWELL. Where?

Senator MORGAN. Yes.

Mr. CROMWELL. In the United States.

Senator MORGAN. Nowhere else?

Mr. CROMWELL. Nowhere else except that when I went to Paris I would confer with the board there?

Senator MORGAN. Where were you to represent the company as counsel?

Mr. CROMWELL. In the United States.

Senator MORGAN. And nowhere else?

Mr. CROMWELL. Oh, in Panama, of course.

Senator MORGAN. And in Panama?

Mr. CROMWELL. Yes, sir.

Senator MORGAN. That meant Colombia, then, did it not?

Mr. CROMWELL. Yes, sir, Colombia, then.

Senator MORGAN. You were to represent the company in Colombia and in the United States.

Mr. CROMWELL. Yes, sir.

Senator MORGAN. In what matters were you to represent the company?

Mr. CROMWELL. In its general interests.

Senator MORGAN. Without limitation or qualification?

Mr. CROMWELL. Such as would arise. I had no specification.

Senator MORGAN. Did you have charge of any diplomatic relations with Colombia?

Mr. CROMWELL. In behalf of the canal company?

Senator MORGAN. Yes.

Mr. CROMWELL. Whatever negotiations were to be conducted I had charge of in behalf the canal company.

Senator MORGAN. Was that embraced in your retainer?

Mr. CROMWELL. Yes, sir.

Senator MORGAN. At the time it was made?

Mr. CROMWELL. Oh, no; it grew up.

Senator MORGAN. Nothing was said about it at the time you were retained?

Mr. CROMWELL. Well, nothing was thought about it then, probably. It had not arisen.

Senator MORGAN. It had not arisen?

Mr. CROMWELL. No.

Senator MORGAN. What were the relations that you held to the Government of the United States? Was there anything diplomatic in those?

Mr. CROMWELL. No, sir.

Senator MORGAN. Did you have business with the Government of the United States connected with the Panama Canal in any way?

Mr. CROMWELL. No, sir.

Senator MORGAN. Not at all?

Mr. CROMWELL. Not at all, except in the matter of carrying through the sale, you know.

Senator MORGAN. Carrying through what?

Mr. CROMWELL. Except in the matter of the sale to the United States, you understand.

Senator KNOX. You did not represent the United States in that?

Mr. CROMWELL. Oh, no; no.

Senator KNOX. I thought not. I had something to do with that, myself.

Mr. CROMWELL. I was speaking about the corporation. I spoke of the company.

Senator KNOX. I misunderstood.

Senator MORGAN. Yes. I did not speak about the United States.

Mr. CROMWELL. No, no. To make it distinct, I say that I had no relation to the Government of the United States, and my duty was solely to the new Panama Canal Company, in which I had certain duties which brought me into negotiation and contact with the Colombian authorities.

Senator MORGAN. With the Government, you mean?

Mr. CROMWELL. With the Colombian Government; yes, sir; and also brought me in contact, for the old Panama Canal Company, with the Government of the United States.

Senator MORGAN. At the time you got that commission or authority to deal with the Government of Colombia, did the French Government have a minister at Colombia?

Mr. CROMWELL. Yes, sir.

Senator MORGAN. Did the Canal have any local agent there?

Mr. CROMWELL. It had.

Senator MORGAN. Were you superior to the local agent in your powers?

Mr. CROMWELL. They were entirely different. My duties were advisory and general, Senator.

Senator MORGAN. And his were special?

Mr. CROMWELL. His were special.

Senator MORGAN. State the difference, besides their being general and special; state what you were authorized to do, and what that local agent was authorized to do.

Mr. CROMWELL. The local agent was simply an agent, who would advise and report to his company at Paris information of general interest. That was all.

Senator MORGAN. He had no right to make contracts?

Mr. CROMWELL. No, sir.

Senator MORGAN. He had no right to direct any operation of the canal company?

Mr. CROMWELL. No, sir; nor had I.

Senator MORGAN. What were your authorities?

Mr. CROMWELL. I had no authority of that description.

Senator MORGAN. Of what description was your authority?

Mr. CROMWELL. Advisory.

Senator MORGAN. Advisory to whom?

Mr. CROMWELL. The company at Paris.

Senator MORGAN. In respect of what matters?

Mr. CROMWELL. Any matters that might happen in which they were interested.

Senator MORGAN. All matters?

Mr. CROMWELL. All matters of that character; yes, sir.

Senator MORGAN. Was any letter of instructions given to you defining your powers?

Mr. CROMWELL. No, sir.

Senator MORGAN. In what way were they made so comprehensive, without any special deposition?

Mr. CROMWELL. By the frequent conferences which I had with them, and the reports I would make to them, and the instructions they would give me.

Senator MORGAN. Was there any attorney or agent of the Panama Canal Company operating or doing business in Colombia that had any right to control you in regard to this matter?

Mr. CROMWELL. No, sir.

Senator MORGAN. Your powers were, then, supreme over any agent of the canal company that might go there?

Mr. CROMWELL. I did not say that. There was no occasion to have any supremacy, because I had no occasion to do anything there.

Senator MORGAN. You had no occasion to do anything at all?

Mr. CROMWELL. Nothing that required the exercise of any powers.

Senator MORGAN. State what your duties were in Colombia.

Mr. CROMWELL. I had no specific duties.

Senator MORGAN. State the scope of your duties.

Mr. CROMWELL. Watchfulness over the general situation and the general attitude of Colombia.

Senator MORGAN. Only watchfulness?

Mr. CROMWELL. Yes, sir.

Senator MORGAN. And report to the company?

Mr. CROMWELL. I would form my own judgment upon it.

Senator MORGAN. And what else? Was that all the power you had?

Mr. CROMWELL. In Colombia?

Senator MORGAN. Yes.

Mr. CROMWELL. Yes, sir; that was the extent of my power.

Senator MORGAN. You had no power, then, to conduct any operations or negotiations with the Government of Colombia that were binding upon the Canal company?

Mr. CROMWELL. Do you mean in Colombia or here?

Senator MORGAN. I mean there in Colombia.

Mr. CROMWELL. No, sir.

Senator MORGAN. Did you have any powers to be operated and executed up here in respect of Colombia of the sort I have been mentioning?

Mr. CROMWELL. The only subject with which we had any connec-

tion with Colombia was in regard to the securing from Colombia of its permission for a transfer of the canal to the United States. The concession, you remember, Senator, prohibited the transfer to any foreign government without the permission of Colombia.

Senator MORGAN. That was all that you had to deal with?

Mr. CROMWELL. It was prohibited, and my effort was to secure that consent.

Senator MORGAN. I wish you would be careful to recollect about that and then state again, after recollection, whether that was all the power that you had down there.

Mr. CROMWELL. Down where?

Senator MORGAN. In Colombia. That all the power you had down there was in dealing with the question of the transfer of the canal to the United States.

Mr. CROMWELL. I think that is the only subject, Senator.

Senator MORGAN. Was that subject defined in any letter of instructions to you from the Panama Canal Company?

Mr. CROMWELL. What subject?

Senator MORGAN. The one you have just answered about.

Senator KITTREDGE. It is now twenty minutes of 5, Senator, and I would like to suggest a little executive session of the committee, if it is a convenient point to rest here.

Senator MORGAN. Very well. Let me get an answer to that question.

(By request the stenographer read the five preceding questions and answers.)

Senator MORGAN. You understand the question, now; answer it, please.

Mr. CROMWELL. I do not recall any specific letter on that subject, Senator.

Senator MORGAN. Was it defined in any resolution of the board of directors of the Panama Canal Company?

Mr. CROMWELL. I do not know.

Senator MORGAN. You do not know?

Mr. CROMWELL. No, sir.

Senator MORGAN. And you never have known?

Mr. CROMWELL. I never have known.

Senator MORGAN. I will stop there, Mr. Chairman.

Mr. CROMWELL. I know our duty was to deal with the matter, and we dealt with it.

(Thereupon the committee went into executive session, after which it adjourned until to-morrow, Tuesday, February 27, 1906 at 10.30 o'clock, a. m.)

ISTHMIAN CANAL.

COMMITTEE ON INTEROCEANIC CANALS,
UNITED STATES SENATE,
Washington, D. C., Tuesday, February 27, 1906.

The committee met at 10.30 o'clock a. m.

Present: Senators Millard (chairman), Kittredge, Dryden, Knox, Ankeny, Morgan, Taliaferro, and Simmons.
(After a short executive session.)

TESTIMONY OF WILLIAM NELSON CROMWELL, ESQ.—Continued.

Senator MORGAN. Mr. Cromwell, a Senator requested me to ask you certain questions, which are in writing, and I will propound them to you one after another and get your answers to them.

When were you first employed by the New Panama Canal Company?

Mr. CROMWELL. In 1896.

Senator MORGAN. When was Mr. Farnham first employed by it?

Mr. CROMWELL. It was long after that, Senator. I have forgotten the exact date, but I can furnish it to you.

Senator MORGAN. What was the character of his employment?

Mr. CROMWELL. Mr. Farnham was employed by my firm, as an attaché of my office.

Senator MORGAN. As an attaché?

Mr. CROMWELL. Yes, sir. He was a regular employee of my firm of Sullivan & Cromwell. I have about 32 people in my service.

Senator MORGAN. How many?

Mr. CROMWELL. Thirty-two. Mr. Farnham was then in the office of the Manhattan Trust Company of New York, as its financial assistant in various ways, and I had become observant of his abilities, and, desiring to add him to the office force on account of his general knowledge—

Senator MORGAN. You are starting off into a history that I have not asked you for—

Mr. CROMWELL. I employed him in that capacity.

Senator MORGAN. Inasmuch as you have opened up the subject of Mr. Farnham in your own way, I will ask whether he was ever a detective of the United States?

Mr. CROMWELL. No, sir.

Senator MORGAN. He never has been?

Mr. CROMWELL. Not that I know of.

Senator MORGAN. Has he ever been a private detective?

Mr. CROMWELL. No, sir.

Senator MORGAN. Have you ever used him as such?

Mr. CROMWELL. Certainly not.

Senator MORGAN. What were the gross sums you and Mr. Farnham received from that company, or from any persons interested in the sale of this property to the United States, either as compensation for yourselves or for any property whatever, previous to the actual payment by the United States of the \$40,000,000 to J. P. Morgan & Co.?

Mr. CROMWELL. Senator, that involves the whole subject of my relations to my clients, the New Panama Canal Company, strictly professional in character, and I must therefore decline to enter into a discussion or consideration either of the business of my clients or of my relations to them.

Senator MORGAN. Did Mr. Farnham hold an official relation to them?

Mr. CROMWELL. No, sir. Mr. Farnham was an employee of my office.

Senator MORGAN. Well, state with regard to him.

Mr. CROMWELL. As to Mr. Farnham, he was simply an employee, receiving a regular salary.

Senator MORGAN. That does not answer the question.

Mr. CROMWELL. He was receiving a regular salary, the amount of which I will gladly state to you.

Senator MORGAN. The question is, What were the gross sums you and Mr. Farnham received from your company or from any person interested in the sale of its property to the United States?

Mr. CROMWELL. I have made reply, sir, so far as concerns myself and my firm.

Senator MORGAN. Is the sum of money that you received for compensation or for salary or expenses in regard to this business a matter that is confidential?

Mr. CROMWELL. Certainly.

Senator MORGAN. It is?

Mr. CROMWELL. Certainly.

Senator MORGAN. Did you get any money from them?

Mr. CROMWELL. Yes, sir.

Senator MORGAN. How much?

Mr. CROMWELL. That is a matter of confidential——

Senator MORGAN. It is the amount, then, and not the fact that you got the money, that constitutes the confidence?

Mr. CROMWELL. It involves my relations with my clients, and I do not feel at liberty to state them. So far as Mr. Farnham is concerned, if you desire to know——

Senator MORGAN. From whom did you receive that money?

Mr. CROMWELL (continuing). If you desire to know the compensation paid to him for his service, it was a regular salary, and I will file with the committee a statement of it.

Senator MORGAN. If you will be good enough to be a witness and not an instructor before this committee, I shall be obliged to you, and it will save us a good deal of time.

(By request the stenographer read the pending question as follows):

“Senator MORGAN. From whom did you receive that money?”

Mr. CROMWELL. From the new Panama Canal Company.

Senator MORGAN. From what person?

Mr. CROMWELL. From the office in Paris.

Senator MORGAN. From what person?

Mr. CROMWELL. It does not come from a person; it comes from the office.

Senator MORGAN. Did the office hand it to you without the assistance of any person?

Mr. CROMWELL. Always by the customary transmission of drafts.

Senator MORGAN. What individual person paid you that money?

Mr. CROMWELL. It was paid out at different times during seven or eight years in customary checks or drafts.

Senator MORGAN. By whom—by what persons?

Mr. CROMWELL. The officers who happened to sign the checks at the moment.

Senator MORGAN. I am not speaking of the man that signed the check; I am asking about the man that made the payments.

Mr. CROMWELL. The payment was made by the corporation itself, coming through its treasury department.

Senator MORGAN. You decline, then, to state what persons paid you that money?

Mr. CROMWELL. I do not decline to state the names of the persons, because the persons were the persons who occupied the office of treasurer or comptroller, at the time being, of the corporation.

Senator MORGAN. You knew who the money came from?

Mr. CROMWELL. It came from the New Panama Canal Company at Paris.

Senator MORGAN. Do you know through whose hands it came?

Mr. CROMWELL. It came through the customary channels of drafts.

Senator MORGAN. Do you know the man that ordered the payment of it, or the body of men that ordered it?

Mr. CROMWELL. The board of directors, of course.

Senator MORGAN. Who were they?

Mr. CROMWELL. Their names are here in the record.

Senator MORGAN. Let us have them.

Mr. CROMWELL. If you will furnish me one of the pamphlets.

Senator MORGAN. No, sir; there is no occasion for furnishing you anything to refresh your memory. I want you to tell me what you know about it.

Mr. CROMWELL. The names of the directors?

Senator MORGAN. Yes.

Mr. CROMWELL. I think they were thirteen in number. I recall the names of Mr. Bô, Mr. Reischman, Mr. Martin, Mr. Moivoisin, and Mr. ———, the names are those of French gentlemen, and the balance of them do not occur to me at the moment; but I will furnish them to you if you so desire.

Senator MORGAN. Are they the men that paid you the money?

Mr. CROMWELL. They are the gentlemen who ordered the money paid.

Senator MORGAN. Did they pay you any of it?

Mr. CROMWELL. They are the gentlemen who ordered the payment of the money.

Senator MORGAN. They ordered the payment?

Mr. CROMWELL. Certainly.

Senator MORGAN. State what payments were made under those orders.

Mr. CROMWELL. I have stated that I regard that as a confidential communication.

Senator MORGAN. What part of it is confidential?

Mr. CROMWELL. All of it.

Senator MORGAN. Why did you answer any of it, then?

Mr. CROMWELL. I have answered sufficiently, sir.

Senator MORGAN. You have answered sufficiently?

Mr. CROMWELL. Yes.

Senator MORGAN. You then decline to answer the question that I have just asked you?

(By request the stenographer repeated the question referred to, as follows:)

"Senator MORGAN. What payments were made under those orders?"

Mr. CROMWELL. I adhere to my reply.

Senator MORGAN. Refusing to state?

Mr. CROMWELL. I regard it as a confidential communication. That is the only reason.

Senator MORGAN. And you refuse to state it?

Mr. CROMWELL. For that reason; yes.

Senator MORGAN. Was that money paid to you in checks or on checks?

Mr. CROMWELL. I think, Senator, we may as well pause here. I regard all these matters as confidential communications.

Senator MORGAN. Well, Mr. Cromwell, I am sorry that you are not a member of the committee, so that you could accommodate your attitude to your pleasure; but I want to know what you have to say in answer to that question, and I will have it repeated to you.

(The stenographer repeated the question, as follows:)

"Senator MORGAN. What payments were made under those orders?"

Mr. CROMWELL. Senator, in order that you may not draw any wrong inference, I shall state to you, although it is no business, I think, of the public or in connection with this inquiry—

Senator MORGAN. Or of the Government?

Mr. CROMWELL. In connection with this inquiry.

Senator MORGAN. This is the inquiry of the Government.

Mr. CROMWELL. The total payments made by the Panama Canal Company to me do not exceed the sum of \$200,000 during the period of my service.

Senator MORGAN. During the period of your service?

Mr. CROMWELL. Yes, sir.

Senator MORGAN. Is that an answer to the question? I did not ask you that question. You have volunteered it, now, and I hold you to it.

(By request, the stenographer read the question referred to by Senator Morgan, as follows:)

"Senator MORGAN. What payments were made under those orders?"

(The stenographer then read the last answer of the witness, as follows:)

"Mr. CROMWELL. The total payments made by the Panama Canal Company to me do not exceed the sum of \$200,000 during the period of my service."

Senator MORGAN. Is that all of the money that you have received out of the forty millions of dollars that the United States have paid to the Panama Company for its property?

Mr. CROMWELL. That is all I have received to date. I have not rendered my final bill.

Senator MORGAN. It has not yet been presented?

Mr. CROMWELL. I have not yet presented my final bill.

Senator MORGAN. When will your service terminate?

Mr. CROMWELL. So far as the transfer of the canal is concerned, it terminated shortly after that transfer.

Senator MORGAN. I do not ask you about that. I ask when your service for that canal company will terminate?

Mr. CROMWELL. When it will terminate?

Senator MORGAN. Yes.

Mr. CROMWELL. I can not tell when it will terminate.

Senator MORGAN. When will your fee or commission, or whatever it may be, fall due?

Mr. CROMWELL. Whenever I choose to present it.

Senator MORGAN. Where is the money to pay it?

Mr. CROMWELL. In the treasury of the company in Paris.

Senator MORGAN. It remains there yet?

Mr. CROMWELL. It does; every dollar of it.

Senator MORGAN. Are you in controversy with that company about your fees?

Mr. CROMWELL. No, sir.

Senator MORGAN. Not at all?

Mr. CROMWELL. Not at all. I have not discussed it with them.

Senator MORGAN. Why have you been so forbearing as not to demand your fees?

Mr. CROMWELL. First, because I have plenty of means and do not need to hurry up such things; second, because I have not had time to go to Paris to speak about it.

Senator MORGAN. You have not had time?

Mr. CROMWELL. No, sir; I have been busy every hour for ten months without a day's vacation.

Senator MORGAN. What is your engagement in regard to being compensated? Is it one for a round sum or is it a commission or is it a retainer?

Mr. CROMWELL. It is a compensation based upon merit and value, and not upon any commission.

Senator MORGAN. Upon what?

Mr. CROMWELL. Upon merit, and not upon commission. I have no pecuniary interest whatever in the sale or in the property of the Panama canal.

Senator MORGAN. Have you not a pecuniary interest in the money that is on deposit in France.

Mr. CROMWELL. Not at all. I have my regular bill for professional services, which I shall render to them as I would to any other client, and which will be paid as it would be paid by any other client.

Senator MORGAN. Has that company any other money to pay you besides that on deposit in the bank there in Paris?

Mr. CROMWELL. I do not know. It is sufficient.

Senator MORGAN. Do you not know?

Mr. CROMWELL. I think it has a balance of a million or so besides, probably.

Senator MORGAN. You think so?

Mr. CROMWELL. I think so.

Senator MORGAN. You know about it, do you not?

Mr. CROMWELL. I do not know. I never made any inquiry. I do not care about it.

Senator MORGAN. Is that company in liquidation?

Mr. CROMWELL. It is, sir.

Senator MORGAN. It is not undertaking to carry on any business?

Mr. CROMWELL. No, sir; it was dissolved and went into liquidation as a consequence of the sale.

Senator MORGAN. Has it been able to pay in full all of its debts?

Mr. CROMWELL. Certainly.

Senator MORGAN. Every one of its debts?

Mr. CROMWELL. Every one.

Senator MORGAN. And all of its stockholders?

Mr. CROMWELL. It has paid out twelve millions to its stockholders.

Senator MORGAN. Well, what about the balance of the stock?

Mr. CROMWELL. The balance of what? The stock or the money?

Senator MORGAN. The stock. Has that been paid, or is it to be paid?

Mr. CROMWELL. I apprehend that you mean the balance of the cash, not of the stock.

Senator MORGAN. No; I mean stock. I mean the sixty millions of stock.

Mr. CROMWELL. The sixty-five millions of stock?

Senator MORGAN. No; the sixty millions. I know about the five millions.

Mr. CROMWELL. Will you kindly ask your question again?

(By request the stenographer read the question referred to, as follows):

“What about the balance of the stock? * * * Has that been paid, or is it to be paid?”

Mr. CROMWELL. The balance in the treasury of the New Panama Canal Company, being the three million dollars undistributed, plus any cash of their own in hand, the precise amount of which I do not know, nor care, remains subject to the payment of their indebtedness of every character.

Senator MORGAN. Well?

Mr. CROMWELL. And after the discharge of all their indebtedness, the remainder will be distributed in a second dividend to their stockholders.

Senator MORGAN. When a company has gone into liquidation, has stopped business, does it not owe an obligation to refund to the stockholders whatever money is left after paying the debts contracted with other persons?

Mr. CROMWELL. The company owes the duty to distribute to the stockholders all that remains after the payment of its indebtedness.

Senator MORGAN. Is the indebtedness that you claim against the company a part of the unpaid engagements and obligations of the company?

Mr. CROMWELL. Certainly.

Senator MORGAN. And the surplus, after paying you—

Mr. CROMWELL. Will be divided among the stockholders.

Senator MORGAN. How long will they be delayed by your pleasure in receiving their money?

Mr. CROMWELL. I do not know, sir.

Senator MORGAN. Why have you not presented your demands against the company for payment?

Mr. CROMWELL. I have explained the reason, if you need any explanation.

Senator MORGAN. I have not heard any explanation.

Mr. CROMWELL. I have explained it, if it needs any explanation.

Senator MORGAN. You may forbear criticism of my conduct, if you please to do so. If you do not, you may go ahead. I asked a question, which I will have the stenographer read.

(The stenographer read the pending question, as follows:)

"Senator MORGAN. Why have you not presented your demands against the company for payment?"

Mr. CROMWELL. Because I have not had time physically to do it—to go there.

Senator MORGAN. You have not had time physically to go there?

Mr. CROMWELL. No, sir. I have not had an hour's vacation for ten months. This is the first recreation I have had.

Senator MORGAN. Is it settled between you and the company as to what you are to receive?

Mr. CROMWELL. I have not asked them.

Senator MORGAN. How?

Mr. CROMWELL. I have not even presented my bill.

Senator MORGAN. You have made no demand?

Mr. CROMWELL. No, sir.

Senator MORGAN. Have you no engagement from the company to pay you money?

Mr. CROMWELL. Certainly the company will pay me my bill. I have not any concern about that.

Senator MORGAN. You have an engagement?

Mr. CROMWELL. I say certainly the company will pay me my bill.

Senator MORGAN. I ask you if you have an engagement from the company to pay you money?

Mr. CROMWELL. The obligation that comes from the performance of the services, certainly.

Senator MORGAN. Have you any contract?

Mr. CROMWELL. No, sir.

Senator MORGAN. Any agreement?

Mr. CROMWELL. No, sir.

Senator MORGAN. Any understanding?

Mr. CROMWELL. Except that my bill will be paid.

Senator MORGAN. Yes. No sum stipulated?

Mr. CROMWELL. No, sir.

Senator MORGAN. No sum settled?

Mr. CROMWELL. No sum settled; no sum suggested.

Senator MORGAN. And you have been physically too busy to go there?

Mr. CROMWELL. I have, and I do not care as much about it as you seem to care about it.

Senator MORGAN. Well, I think that the country cares a good deal about it.

Mr. CROMWELL. You may monopolize the opinion of the country, but I do not think you do.

Senator MORGAN. I am not monopolizing it. I am trying to represent it. Now, as you have already stated that you received some sums and that Mr. Farnham received some sums from this corporation or company, state what sums those were and when they were received.

Mr. CROMWELL. I decline to state the details of the professional compensations paid me, Senator. I have given you the gross sum,

and I consider that really far beyond the proprieties of the case, either for you to interrogate or for myself even to disclose.

Senator MORGAN. Mr. Knox, can you refer me to the statute in regard to the protection of witnesses? I unfortunately forget it.

Senator KNOX. It is section 102, I think. Have you the Revised Statutes here?

Senator MORGAN. Let me have that, please; I wish to read it to the witness.

Senator KNOX. Shall I find it for you?

Senator MORGAN. If you please, sir.

(After the finding of the section referred to:)

Senator MORGAN. Section 101 of the Revised Statutes, passed the 24th of January, 1857, I believe—that is the date of it here—provides:

“The President of the Senate, the Speaker of the House of Representatives, a Chairman of a Committee of the Whole, or of any committee of either House of Congress, is empowered to administer oaths to witnesses in any case under their examination.

“SEC. 102. Every person who, having been summoned as a witness by the authority of either House of Congress to give testimony or to produce papers upon any matter under inquiry before either House, or any committee of either House of Congress, wilfully makes default, or who, having appeared, refuses to answer any question pertinent to the question under inquiry, shall be deemed guilty of a misdemeanor, punishable by a fine of not more than one thousand dollars nor less than one hundred dollars, and imprisonment in a common jail for not less than one month nor more than twelve months.

“SEC. 103. No witness is privileged to refuse to testify to any fact, or to produce any paper, respecting which he shall be examined by either House of Congress, or by any committee of either House, upon the ground that his testimony to such fact or his production of such paper may tend to disgrace him or otherwise render him infamous.

“SEC. 104. Whenever a witness summoned, as mentioned in section 102, fails to testify, and the facts are reported to either House, the President of the Senate or the Speaker of the House, as the case may be, shall certify the fact under the seal of the Senate or House to the district attorney for the District of Columbia, whose duty it shall be to bring the matter before the grand jury for their action.”

Having read that statute to you, Mr. Cromwell, do you still refuse to answer the question, which I will ask the stenographer to repeat to you?

(The stenographer read as follows:)

“Now, as you have already stated that you received some sums and that Mr. Farnham received some sums from this corporation or company, state what sums those were and when they were received.”

Mr. CROMWELL. I still consider it is beyond the purview of this committee to make the inquiry, and that it is confidential in character.

Senator MORGAN. And you refuse to answer the question?

Mr. CROMWELL. And I refuse to answer the question.

Senator MORGAN. Mr. Chairman, I will reserve the question of the materiality and the probable steps to be taken for further action by the committee, and proceed with the examination.

The CHAIRMAN. Proceed with the examination, Senator, if you please.

Senator MORGAN. Question No. 4 is as follows:

What are the gross sums you and Mr. Farnham have received from all sources connected with the canal affairs since that payment to J. P. Morgan & Co., whether from the old or the New Panama Canal Company, or any shareholders or syndicate of expectant or actual shareholders in them or either of them, or from the Panama Railroad Company, or from the United States, or from the Republic of Panama; and were such sums received by yourself and Mr. Farnham wholly for yourselves or partly to be paid to other persons?

Mr. CROMWELL. Senator Morgan, I thank you for this question.

Senator MORGAN. Well, sir, I will be obliged to you not to express your compliments in public. [Laughter.]

Mr. CROMWELL. Well, my dear Senator, I think much better of you than you think I do. I thank you for this question.

Senator MORGAN. Please forbear to compliment me in public.

Mr. CROMWELL (continuing). And I propose to answer it completely, because it relates to a time subsequent to the transfer, as to which I consider that I am in duty bound to give this committee all information within my power.

Senator MORGAN. And nothing before?

Mr. CROMWELL. I have given you very much more concerning the anterior period than I think was strictly due, Senator. Permit me to answer—

Senator MORGAN. Well, having answered that, are you not obliging enough to go on and tell the whole story about what you did with this canal before the purchase?

Mr. CROMWELL. Will you permit me, Senator, to answer one question at a time? You have asked a very full question there.

Senator MORGAN. Well, I will take an answer to that. You have injected this question into the examination, and I want it answered now.

(The pending question was read aloud by the stenographer, as follows:)

“Well, having answered that, are you not obliging enough to go on and tell the whole story about what you did with this canal before the purchase?”

Mr. CROMWELL. I do not consider it appropriate to discuss the period anterior, first, because this committee has no power to go into that subject, and, second, because it involves confidential communications.

To the second question which you have asked me, I wish to give an explicit answer; and as I see you have prepared it in writing very carefully, I will ask the stenographer to please divide it into single parts, piece by piece, that I may answer it piece by piece completely.

(After the reading of the question by the stenographer.)

Mr. CROMWELL. I have not received one dollar of the forty millions from the New Panama Canal Company. My final bill in that regard I will present in due course as any other professional bill, and it will be substantial. It will be paid; of that I have no concern.

I have not received from the Government of Panama a single penny for any purpose whatever.

I have not received or obtained benefit, directly or indirectly, in the remotest manner that human ingenuity could describe to the extent of a single farthing from any syndicate, combination, organization, or party soever in connection with the sale of the Panama Canal.

I was never interested in the securities of the New Panama Canal Company, nor in the securities of the old Panama Canal Company. I never owned a dollar in either, and never had a pecuniary interest of the remotest character in either, and consequently I never had a single dollar of benefit therefrom.

My whole relation to the Panama Canal affair is that of counsel practicing his profession purely as a lawyer, and having no pecuniary interest in any one of the relations, direct or indirect, surrounding the Panama Canal.

My sole compensation, or that of my firm, rather, has been the stipend paid by the Panama Railroad Company as its general counsel, which place we had occupied for ten years preceding the transfer to the United States, and which we were requested to continue during the past two years.

(By request, the stenographer read aloud the foregoing answer of the witness.)

Senator KNOX. Does that question include Mr. Farnham?

Mr. CROMWELL. Thank you. I was going to come to that. In the answer which I have made, and which I have made deliberately and with all the explicitness that it is possible, by intendment as well as by expression, to convey, I include Mr. Roger L. Farnham, an attaché of my office, whose sole return and compensation has been that upon the salary roll of my office—a salary of, I think, about \$3,500 per year.

Senator KNOX. Will you let me ask a question there, Senator Morgan?

Senator MORGAN. Yes; certainly.

Senator KNOX. I want to get this perfectly clear in my own mind, Mr. Cromwell.

Mr. CROMWELL. Yes, sir.

Senator KNOX. Do I understand it to be your intention to have us understand that, speaking for yourself, your firm—

Mr. CROMWELL. For my firm.

Senator KNOX (continuing). The employees of your firm—

Mr. CROMWELL. And all the agents—

Senator KNOX. Now, just let me put this in my own way, please.

Mr. CROMWELL. Excuse me.

Senator KNOX (continuing). That the only compensation you have received or expect to receive or have contracted to receive has been from the New Panama Canal Company for professional services rendered to that company in the sale of its property to the United States, and such salary as is attached to the position of counsel for the Panama Railroad which has been paid by the Government since it has taken over the property?

Mr. CROMWELL. Absolutely, correctly, solely, completely, and truly.

Senator MORGAN. Does that include all your expectations in regard to future compensation from all these sources that you speak of—all these employments?

Mr. CROMWELL. I have told you, Senator, that I have yet to render my account to the Panama Canal Company.

Senator MORGAN. I do not speak of that. I speak of the other matters that you have mentioned in your answer.

Mr. CROMWELL. Absolutely; yes, sir.

Senator MORGAN. It includes all your expectations?

Mr. CROMWELL. Absolutely.

Senator MORGAN. Now, you mentioned that you never had any interest in the securities of the Panama Canal Company?

Mr. CROMWELL. Yes, sir.

Senator MORGAN. Do you include stocks in that?

Mr. CROMWELL. Stocks are securities; I include stocks, bonds, obligations, and any form of evidence of debt that even your able mind can devise, Senator.

Senator MORGAN. Yes. Now, Mr. Cromwell, you limit yourself now to the period since the United States acquired title to the Panama Canal?

Mr. CROMWELL. I do not. I extend that answer to the whole period—forever.

Senator MORGAN. Clear back?

Mr. CROMWELL. Forever.

Senator MORGAN. Why do you object, then, to stating the payments that you have received from the Panama Canal Company from time to time, or the advances you have received, and put it upon the ground of a professional confidence?

Mr. CROMWELL. Oh, just because I do not think it is appropriate, and I think it is not at all pertinent to the inquiry. I think it transcends, I think it passes the bounds of propriety and decency.

Senator MORGAN. Suppose the committee, which stands as a court here, declares that it is pertinent—do you still refuse to state it?

Mr. CROMWELL. I have given my answer, Senator. If anything could be more frank—

Senator MORGAN. You have mentioned the fact that you have received from the Panama Canal Company various sums of money at different times antecedent to the sale of this property by the Panama Canal Company to the United States.

Mr. CROMWELL. Yes, sir.

Senator MORGAN. And now you decline to mention or to state the sums you have received and that Farnham has received?

Mr. CROMWELL. I have stated to you that in gross it does not exceed \$200,000, and I think Mr. Farnham's salary has been about \$3,000 or \$3,500; and that is all.

Senator MORGAN. Now, then, you have received as much as \$200,000?

Mr. CROMWELL. As little as \$200,000, you mean.

Senator MORGAN. Well, as little, if you please to put it that way. I look up at such sums; I do not look down on them. You have received that little, as you put it, and Farnham has received during the same time certain sums only from you?

Mr. CROMWELL. Only from my firm; solely from my firm.

Senator MORGAN. He has received nothing at all, as I understand now, from the Canal Company?

Mr. CROMWELL. Oh, no; no, sir; just solely from my office. He is a regular attaché of my office, as twenty other people are.

Senator MORGAN. But Farnham has had no dealings with the Canal Company?

Mr. CROMWELL. None; none.

Senator MORGAN. And has received nothing from it?

Mr. CROMWELL. Nothing.

Senator MORGAN. So that the entire sum, the little sum of \$200,000, that has come into your hands from them has passed through your own hands?

Mr. CROMWELL. It has.

Senator MORGAN. Did you receive that for professional services?

Mr. CROMWELL. Yes, sir.

Senator MORGAN. Paid on account?

Mr. CROMWELL. Yes, sir; paid on account.

Senator MORGAN. In what dividends or instalments did you receive it?

Mr. CROMWELL. Oh, an average of about ten or fifteen thousand dollars a year.

Senator MORGAN. A small matter of ten or fifteen thousand dollars a year?

Mr. CROMWELL. Yes, sir.

Senator MORGAN. Where did you receive the money—from whom?

Mr. CROMWELL. From the Paris office.

Senator MORGAN. How did you receive it—upon checks drawn by you?

Mr. CROMWELL. No, sir; by the customary bills of exchange sent forward.

Senator MORGAN. Is not that a check or a draft?

Mr. CROMWELL. It is not a check, sir.

Senator MORGAN. Would they send you a draft for the money?

Mr. CROMWELL. Oh, of course.

Senator MORGAN. I suppose there is a record of the payments to you in that office?

Mr. CROMWELL. Oh, yes; oh, yes. There is no mystery about it at all, Senator.

Senator MORGAN. I am not trying to make a mystery of it; I am trying to get the light out of it. Now, what services did you render for this \$200,000.

Mr. CROMWELL. Well, Senator, that is a question that can hardly be answered seriously.

Senator MORGAN. How is that? You do not know how it can be answered? I did not hear you.

Mr. CROMWELL. That involves completely and necessarily my professional relations to my client, and it involves all the topic of our professional service and relation, which you know so well, as an experienced lawyer, is a privileged communication, and which I feel no more at liberty to state than I would the business of any other client of my office.

By request of Senator Morgan, the stenographer read aloud the following question:

“Now, what services did you render for this \$200,000?”

Mr. CROMWELL. I am unable to specify and state the services that I have rendered for that.

Senator MORGAN. Was it an annual retainer that you were acting under—a retainer payable annually?

Mr. CROMWELL. It was paid on account, approximately \$10,000 or \$15,000 a year.

Senator MORGAN. How much a year?

Mr. CROMWELL. Approximately \$10,000 or \$15,000 a year; an average of about \$15,000 a year.

Senator MORGAN. An approximation of \$10,000 or \$15,000 is not close upon a sum of that magnitude. I would like you to state now what amount of money was due you by your agreement with the Panama Canal Company annually for your services as a lawyer?

Mr. CROMWELL. There was no agreement of annual payment.

Senator MORGAN. Were the payments made annually?

Mr. CROMWELL. No, sir; not always. They were made whenever I called for them.

Senator MORGAN. You submitted your bill?

Mr. CROMWELL. No; I simply called for a sum when I wished it.

Senator MORGAN. You did not submit any bills at all?

Mr. CROMWELL. No, sir; I had no occasion to. The service was so manifestly many times the payments made upon account that it needed no specification. My clients are satisfied, Senator.

Senator MORGAN. Was that money paid to you exclusively for professional services?

Mr. CROMWELL. And our office expenses—certainly.

Senator MORGAN. How is that—the office expenses?

Mr. CROMWELL. Yes, sir.

Senator MORGAN. Office expenses where?

Mr. CROMWELL. In the conduct of the business of the canal company.

Senator MORGAN. At what place?

Mr. CROMWELL. In New York.

Senator MORGAN. In New York?

Mr. CROMWELL. Yes, sir.

Senator MORGAN. Did they pay your office expenses and——

Mr. CROMWELL. Oh, no; I say for such expenses as I would incur for them.

Senator MORGAN. For whom?

Mr. CROMWELL. For the canal company.

Senator MORGAN. What expenses did you incur for the canal company?

Mr. CROMWELL. Oh, such as clerk hire and stenographers, or employment in taking opinions of counsel upon particular points and the like; relatively a small matter.

Senator MORGAN. Payment to agents?

Mr. CROMWELL. No, sir.

Senator MORGAN. To orators or lecturers?

Mr. CROMWELL. Oh, no; no, sir.

Senator MORGAN. Anything of that sort?

Mr. CROMWELL. Nothing.

Senator MORGAN. Or to newspapers?

Mr. CROMWELL. No, sir.

Senator MORGAN. Nothing of the sort?

Mr. CROMWELL. Nothing of the sort.

Senator MORGAN. Merely clerk hire and stenographers and office expenses?

Mr. CROMWELL. Yes, sir.

Senator MORGAN. I suppose you include that in office expenses—clerk hire and stenographers?

Mr. CROMWELL. Yes; and the special engineers. I employed at one time an engineer to prepare opinions and give expert advice upon particular topics.

Senator MORGAN. What topic?

Mr. CROMWELL. Oh, the canal topic, of course.

Senator MORGAN. What were they; what part of the canal topic?

Mr. CROMWELL. Oh, I do not recall, but upon engineering topics.

Senator MORGAN. Just general canal topics?

Mr. CROMWELL. General engineering matters.

Senator MORGAN. Have you ever seen a map of a canal topic?

Mr. CROMWELL. I have seen a map.

Senator MORGAN. I have seen maps. To what particular map do you refer when you speak of the employment of that engineer?

Mr. CROMWELL. He was employed to examine the plans and read the literature upon the subject, and give me advice and opinions as to the technical features of the engineering problem which I was not so experienced about as he would be.

Senator MORGAN. Engineering problems about what?

Mr. CROMWELL. Of the canal.

Senator MORGAN. The whole of it?

Mr. CROMWELL. Yes, sir.

Senator MORGAN. Or any particular feature?

Mr. CROMWELL. No; the whole of it.

Senator MORGAN. Who was that engineer?

Mr. CROMWELL. Mr. E. L. Corthell.

Senator MORGAN. Mr. Corthell?

Mr. CROMWELL. Yes, sir.

Senator MORGAN. I expected he would turn up in this case.

Mr. CROMWELL. He is a very competent engineer, too. This was several years ago; but it was for expert advice and services of that character.

Senator MORGAN. We are not asking for any eulogies upon Mr. Corthell that I know of. This next question is:

What money belonging to the Republic of Panama have you now in your custody or control or subject in any way to your supervision, whether invested or otherwise?

Mr. CROMWELL. The statement submitted yesterday, which I designed to make so explicit that he who runs might read, tells you precisely where every dollar of the canal money is now invested.

Senator MORGAN. That does not answer the question.

Senator TALIAFERRO. You mean the money of the Republic of Panama?

Mr. CROMWELL. Yes, sir; the money of the Republic of Panama; yes, sir.

Senator MORGAN. What money belonging to the Republic of Panama have you now under your custody or control or subject in any way to your supervision, whether invested or otherwise?

Mr. CROMWELL. The moneys of the Republic of Panama are invested in the manner which I so fully presented to you yesterday.

Senator MORGAN. That does not answer the question.

Mr. CROMWELL. Those are invested in the New York trust companies, in the name of the Republic of Panama.

Senator MORGAN. You have stated the investment. Now, the question is, whether—

Mr. CROMWELL. Part of this money—

Senator MORGAN. Well, wait a moment, until I get a question out, if you allow me to proceed. I think I have some privileges in this room, at all events. You are asked this question as to what control you have over any funds, invested or uninvested, that belong to the Republic of Panama. Can you not answer that?

Mr. CROMWELL. Yes, sir. The moneys on deposit in the banks and trust companies of New York in the manner described stand in the name of the Republic of Panama. I am the fiscal commissioner appointed by the Republic of Panama; and as such, when ordered and directed by the secretary of treasury of Panama, I will be empowered to withdraw and disburse by his order those cash funds.

Senator MORGAN. What are your functions and duties as fiscal commissioner of the Republic of Panama?

Mr. CROMWELL. My function and duty is to have supervision over the funds mentioned in the list so far they reside in the United States.

Senator MORGAN. What do you mean by "supervision?"

Mr. CROMWELL. To see that they are safely cared for, safely preserved, protected, and to obey in respect of those funds such orders as from time to time I may receive from the minister to hacienda.

Senator MORGAN. Who made these investments for Panama?

Mr. CROMWELL. The fiscal commissioners, Messrs. Morales and Arias.

Senator MORGAN. They made the investments?

Mr. CROMWELL. They made the investment. I was appointed, as I have mentioned yesterday, legal advisor to that fiscal commission, and they made the investment during a period of several months, in which, perhaps, a thousand applications were examined, of which all were rejected except thirty-two, and those thirty-two I have enumerated in the list furnished you yesterday.

Senator MORGAN. They were appointed fiscal commissioners to invest the funds?

Mr. CROMWELL. They were.

Senator MORGAN. And you were employed as counsel to advise them?

Mr. CROMWELL. I was appointed by decree of the Government of Panama as the adviser of that commission.

Senator MORGAN. After those funds were invested what further connection had you with the question of handling them or managing them or taking care of them as fiscal agent, as you have described yourself, of the Government of Panama?

Mr. CROMWELL. Only to see that they are preserved; that the interest upon the mortgages is properly collected and paid in to the fiscal agents, Messrs. J. P. Morgan & Co.; to see that the insurance upon all those mortgages is continued and preserved, and to see that the taxes upon the property concerned are paid, so that the mortgage security is protected.

Senator MORGAN. You have introduced a new party here as a fiscal agent—J. P. Morgan & Co.

Mr. CROMWELL. Yes, sir.

Senator MORGAN. Do they occupy that relation?

Mr. CROMWELL. They do; they are the bankers. I do not handle the moneys.

Senator MORGAN. You are the commissioner—

Mr. CROMWELL. I do not handle the moneys of the Republic.

Senator MORGAN. Wait a moment. You are the commissioner, the fiscal commissioner, are you?

Mr. CROMWELL. Yes, sir.

Senator MORGAN. What has become of these other two men that were associated with you in that connection?

Mr. CROMWELL. They were not associated with me. They were appointed fiscal commissioners to make the investment of the six million fund and to deposit the balance of that fund.

Senator MORGAN. Did they conclude their work?

Mr. CROMWELL. They concluded their labors. They nearly concluded their labors, except certain small formalities, and in succession I was by decree of the Government of Panama appointed fiscal commissioner to conclude their labors and to carry forward any matters which from time to time might arise.

Senator MORGAN. So that now you are the sole fiscal agent of the Panama Government in the United States?

Mr. CROMWELL. No, sir; not the sole agent, sir; the sole fiscal commissioner.

Senator MORGAN. Commissioner—yes; and Morgan & Company are the fiscal agents?

Mr. CROMWELL. The bankers—fiscal agents or bankers; yes, sir.

Senator MORGAN. What are their functions?

Mr. CROMWELL. To receive all moneys that are paid in to them, and to account and to check and to draw upon them—the customary banking facilities.

Senator MORGAN. Does that relate to the current revenues of the Government?

Mr. CROMWELL. No, sir; the current revenues of the Government are deposited and received upon the Isthmus of Panama and do not come to the United States.

Senator MORGAN. This agency and commissionership relates to the money that was received from the United States by Panama—the \$10,000,000?

Mr. CROMWELL. Yes, sir.

Senator MORGAN. And only to that?

Mr. CROMWELL. Only to that, sir.

Senator MORGAN. And in controlling that, now, you are fiscal commissioner and Morgan & Co. are fiscal agents?

Mr. CROMWELL. Yes, sir.

Senator MORGAN. If that money is invested and safely invested, as I suppose you think it is—

Mr. CROMWELL. Do you not think it is?

Senator MORGAN. Really, I do not know whether money is well invested or not. I do not know enough about it or care enough about it to find out.

Mr. CROMWELL. Well, Senator, I wish—

Senator MORGAN. We differ in some of our tastes, I discover.

Mr. CROMWELL. Yes, sir; that is so. We are very proud of it, sir—savings-bank investments.

Senator MORGAN. What is the occasion for having Morgan & Co. as the fiscal agents, while you are fiscal commissioner, to take care of this same property?

Mr. CROMWELL. Not of the same property, Senator.

Senator MORGAN. What is the difference?

Mr. CROMWELL. Messrs. Morgan & Co. were appointed fiscal agents before I had anything to do with the subject.

Senator KNOX. That was before the money was paid to them, was it not?

Mr. CROMWELL. Yes, sir; and before the money was paid—before the ten million was paid. They were appointed prior to that, and the ten million was paid to them as fiscal agents of the Republic of Panama.

Senator MORGAN. Just a moment, there. Did they pay over that money to Panama?

Mr. CROMWELL. No, sir; I was going to explain how that was. They invested it in this way. Then the Republic of Panama, by its constitution, after full debate, enacted an indelible provision that six million dollars of the ten should be invested permanently, for the benefit of the nation, only in first-mortgage security.

Senator KNOX. Do you know the date of the adoption of that constitution?

Mr. CROMWELL. Yes, sir; I think I have it here. [After examining papers.] No; I fear I have not; but I will get it for you.

Senator KNOX. Yes; I would like to have it before you get through.

Mr. CROMWELL. I will make a note of it. I will get it for you this afternoon, Senator.

In pursuance of that the Panama Government appointed two fiscal commissioners, as I have said—Messrs. Arias and Morales, two distinguished citizens—to come here and to invest that fund. As it involved legal questions, they paid me the honor of appointing me, by public decree, as legal adviser to that commission. The commission sat in the United States for several months; they were deluged, as you may imagine, by applications from everybody, for the fact of investment was well known, world-wide, and there were perhaps a thousand different applications presented. Each one was sifted, examined, scrutinized, turned upside down and inside out by us, and the result was that—

Senator MORGAN. Well, I do not think that there is any occasion for all of this.

Mr. CROMWELL. You do not care for this, do you?

Senator KITTREDGE. I think it is just as important as any of it.

Senator MORGAN. Well, go ahead.

Senator KITTREDGE. I do not think any of it is pertinent.

Senator MORGAN. Go ahead.

Mr. CROMWELL. The result was the investment, by selection, of \$5,165,500 in 4½ per cent first mortgages upon improved real estate in the city of New York, each piece of property being of the highest rank and the titles to which were not only examined by my firm, but were guaranteed by title companies, making them “bomb proof.”

Senator KNOX. Mr. Cromwell, did not this Government take the position that owing to its vital interest in the financial stability of Panama and its interest in having them maintain a permanent financial position, that money should be invested in a class of securities that would be approved under the laws of the State of New York for the investment of savings-bank funds?

Mr. CROMWELL. Senator, you are right; and if you will permit me to make a personal allusion, it was President Roosevelt and yourself who upon me urged especial advice to that effect when you were Attorney-General.

Senator KNOX. I did not intend to bring out that fact; I only wanted—

Mr. CROMWELL. It is the fact; it is the fact. You have perhaps

forgotten it. That took care, Senator Morgan, of \$5,165,000—just such investments as a man would be glad to leave to his own estate. The only bonds purchased were those of the Panama Railroad Company itself, being of the highest character and for those was paid a premium of 105. That made up the \$6,000,000. The remaining sum—

Senator MORGAN. What was the interest on these bonds?

Mr. CROMWELL. Four and one-half per cent, sir.

Senator MORGAN. Four and one-half per cent?

Mr. CROMWELL. Yes, sir; on all.

Senator MORGAN. How are they secured?

Mr. CROMWELL. The Panama Railroad bonds?

Senator MORGAN. Yes.

Mr. CROMWELL. By first mortgage upon the Panama Railroad property of every kind.

Senator MORGAN. Are they bonds issued by the Panama Railroad Company?

Mr. CROMWELL. They are bonds issued by the Panama Railroad Company; yes, sir. Those were the 4½ per cent Panama Railroad bonds.

Senator MORGAN. Gold bonds?

Mr. CROMWELL. Gold bonds.

Senator MORGAN. Still outstanding?

Mr. CROMWELL. Still outstanding; purchased in the market. They were purchased in the market at 105 per cent—5 per cent premium.

That constituted the six millions, Senator—a sacred trust fund that runs forever. That, by the constitution, is unchangeable, except as to the security. It left four million. Of the four million I have given you a statement showing that \$2,800,000 is to this hour on deposit in the various banks that I have named, bearing interest at from 2 to 3 per cent.

Senator MORGAN. Have you ever heard that anybody complained or made any criticism upon the investments in favor of the Government of Panama?

Mr. CROMWELL. I have no information on the subject. I am very happy to state the fact.

Senator DRYDEN. Before you pass from the deposits in bank, what authority, if any, has the Government of Panama to draw that money out of the banks or trust companies?

Mr. CROMWELL. Absolute right.

Senator DRYDEN. They can draw at option?

Mr. CROMWELL. They can draw ad libitum.

Senator DRYDEN. How much of the ten millions, then, is permanently tied up?

Mr. CROMWELL. Six million dollars forever by constitutional provision, which I will furnish Senator Knox this afternoon.

Senator KNOX. I think this is pertinent to our interest in the stability of that financial arrangement. That is the only reason I asked anything about it, Senator.

Senator MORGAN. If there is any reason for it at all, go ahead. I simply could not see it; that is all.

Senator KNOX. No; I have had all the information I desire.

The CHAIRMAN. I will say, Senator Morgan, that the information we

are getting now from Mr. Cromwell was given us entirely yesterday. He itemized every dollar, I think.

Senator MORGAN. I think so.

The CHAIRMAN. I think it was all brought out yesterday.

Senator MORGAN. But he likes the subject, and I want—

Senator KNOX. Well, I will take the whole responsibility of this part of it. I wanted to understand certain things from Mr. Cromwell, and I think that ought to be sufficient.

The CHAIRMAN. Yes; it is quite sufficient.

Senator MORGAN. It is quite sufficient for me. I have no objection to it at all. I was merely inquiring as to where we were going and what we were doing it for.

The CHAIRMAN. Now, Senator Morgan, will you proceed with your other questions, please?

Senator MORGAN. We have been all over this ground once before on his voluntary statement.

Senator KNOX. I am opposed to going over a thing twice. I shall not repeat again.

Senator MORGAN. Do not understand me as objecting at all.

Senator KNOX. I do not, Senator; I do not. I understand that you yield me all my rights.

Senator MORGAN. Now, Mr. Cromwell, you are occupying, as I understand it, some relation of care taker, or some relation of guardianship over these investments?

Mr. CROMWELL. Yes, sir.

Senator MORGAN. Have you the right, on your draft, to draw any money as commissioner, or to control either of these depositaries in respect to the money of the Panama Canal Company?

Mr. CROMWELL. If the Secretary of the Treasury ordered me to make a payment I would have the power to do so.

Senator MORGAN. Why is it necessary to have you there for the purpose of his ordering you to make the payment?

Mr. CROMWELL. Because you must have somebody in New York to do it.

Senator MORGAN. Have you given any bond in this matter?

Mr. CROMWELL. No, sir; the Panama people do not consider it necessary to put me under bond, sir, and I hope you do not.

Senator MORGAN. I do not think I do. I do not think it would do any good if we did.

Mr. CROMWELL. I hold a hundred millions of money, Mr. Morgan, and I do not require to give bonds.

Senator MORGAN. Yes, I know—I really do not know, but I am now informed, that you are a man of great money and great ability and great reputation for business conduct, etc. Now, what compensation do you get or have you received from this laborious work you have been engaged in in the investment of this money or in its care-taking?

Mr. CROMWELL. In all the investment of the Panama Government moneys, of which, as I have said, I was appointed by decree adviser, I regarded it as an honor, and I declined compensation.

Senator MORGAN. You declined compensation?

Mr. CROMWELL. My firm, as lawyers searching titles, were compensated in the customary way for the regular work of searching titles which lawyers perform, which, however, was not paid by the Republic.

Of course, it is always paid by the party who gives the mortgage. The total amount of that compensation from that source earned by my partners or by my firm aggregated, I think, about \$26,000.

Senator MORGAN. It was that fee of \$26,000, or that income of \$26,000, then, that interested you and your firm in this business?

Mr. CROMWELL. Not at all.

Senator MORGAN. It did not interest you at all?

Mr. CROMWELL. Not at all; it was merely a consequent of it.

Senator MORGAN. A very present consequence, was it not?

Mr. CROMWELL. Merely a customary professional work, Senator, which occurs in my business every day.

Senator MORGAN. But still there was that much coming in—\$26,000?

Mr. CROMWELL. Yes, sir—that much earned honestly.

Senator MORGAN. Yes; I have no doubt about your earning it honestly; but that was your interest and all your interest in your connection with this commissionership?

Mr. CROMWELL. Yes; that is the only pecuniary benefit of any kind; yes, sir.

Senator MORGAN. The balance of it was all honor?

Mr. CROMWELL. That is the only pecuniary interest of any kind.

Senator MORGAN. How long were you in earning that \$26,000?

Mr. CROMWELL. Oh, I had nothing personally to do with that. My partners took care of that part of the business. It occupied four or five months, as I say, in the examination of perhaps a thousand applications, rejections of them, and the final selection of those that were selected.

Senator MORGAN. Now describe the agency and the character of the duties of J. P. Morgan & Co. in this same connection.

Mr. CROMWELL. J. P. Morgan & Co. are the regular fiscal agents of the Government of Panama, and have been so from the beginning. They conduct the regular banking business of the Republic so far as it concerns the United States and their current account. They handle the physical moneys so far as the Republic have any dealings of that kind to conduct in New York.

Senator MORGAN. What is their compensation in dollars, or their rate of compensation, for their work?

Mr. CROMWELL. I do not know, sir; I have no particular information about that. They have the regular banking charges.

Senator MORGAN. Does all money that belongs to the Government of Panama, except that that is earned and disbursed or collected and disbursed on the Isthmus, pass through this bank of Morgan & Co.?

Mr. CROMWELL. I do not know, sir.

Senator MORGAN. Did the ten millions of dollars paid by the United States pass through their bank?

Mr. CROMWELL. It did; the \$10,000,000 was checked out and invested in the way I have described. The fiscal commissioners checked out the money from J. P. Morgan & Co. and invested it and deposited it in the manner I have described.

Senator MORGAN. What was the occasion for having any deposit in Morgan's bank of this money, ten millions of dollars?

Mr. CROMWELL. I do not know, sir. That is their business.

Senator MORGAN. Was not the Government of the United States able to pay it in its warrants?

Mr. CROMWELL. It did pay it in its warrants.

Senator MORGAN. It paid it to whom?

Mr. CROMWELL. To J. P. Morgan & Co., fiscal agents of the Republic.

Senator MORGAN. Yes; fiscal agents of the Republic.

Mr. CROMWELL. That is the only way the Republic could get it.

Senator MORGAN. You do not know whether Morgan & Co. did this for honor and glory, or whether they did it for gain?

Mr. CROMWELL. I know nothing about that, sir. I suppose they did it for the regular banking commission to which they are entitled, of course. I do not suppose even a Senator serves without compensation, even though there is great glory in the office.

Senator MORGAN. We come pretty close to it. [Laughter.]

Mr. CROMWELL. Well, Senator, I am frank to say that it is altogether too close, and if I ever had a chance to vote on it, I would make it five times as much.

Senator MORGAN. Oh, if we had any part of your magnificent endowments we would be well off; there is no doubt about that. Now, Morgan & Co. have still continued in that fiscal agency?

Mr. CROMWELL. Yes, sir; they conduct the current banking business down there, Senator. I have nothing to do with that. The only other duty which I have as fiscal commissioner—and my duties are rather of a desultory character, only as particular occasion arises—was in respect of the coinage.

Senator MORGAN. Did Morgan & Co. handle also the forty millions that the United States paid to the Panama Canal Company?

Mr. CROMWELL. Yes, sir; they were appointed by the Government of the United States as special fiscal agents to transmit that money under the direction of Attorney-General Knox.

Senator MORGAN. You do not know what necessity existed for appointing a fiscal agent of the United States to disburse the money in Paris?

Mr. CROMWELL. I do know; yes, sir.

Senator MORGAN. What was it?

Mr. CROMWELL (after a pause). I am trying to abbreviate, so that I will not make too long a story of it.

Senator MORGAN. Never mind about the length of the story. If you will tell it right, go ahead.

Mr. CROMWELL. I would like to tell it all to you.

Senator MORGAN. Oh, you have taken a good many liberties in talking, and you may talk to your heart's content.

Mr. CROMWELL. If I can talk to your content, sir, it is all I care for. In the closing of the title it became desirable to make the payment into the Bank of France at Paris.

Senator MORGAN. Desirable to whom?

Mr. CROMWELL. To both parties, the United States Government and the canal. This involved the transmission of that fund to Paris. To accomplish that of course some financial instrumentality must be engaged.

Senator MORGAN. Why "of course?"

Mr. CROMWELL. It was the opinion of Attorney-General Knox that the expense of that transmission should fall upon the New Panama Canal Company.

Senator MORGAN. What was the occasion for the transmission? Why could not the payment have been made here?

Mr. CROMWELL. The payment might have been made here, but there was this practical situation that had to be dealt with: The parties, you observe, were in Paris.

Senator MORGAN. The United States was not in Paris, was it?

Mr. CROMWELL. The selling party was in Paris, and the instruments of transfer and delivery, etc., were to be executed and delivered, while also there was to be physical possession delivered contemporaneously on the Isthmus, thousands of miles away.

Senator MORGAN. You say these instruments were to be delivered—instruments of title, do you mean?

Mr. CROMWELL. Instruments of conveyance—instruments of title; yes, sir.

Senator MORGAN. Delivered where and to whom?

Mr. CROMWELL. In Paris.

Senator MORGAN. Why in Paris?

Mr. CROMWELL. I was trying to explain why, sir, by showing the situation. The documents being executed in Paris, where the selling corporation existed, and the property that was to be delivered being located on the Isthmus, and the money being in Washington, if you please, it became necessary to devise some intelligent, practical way by which these three localities, so to speak, should be concentrated in a single spot.

Senator MORGAN. Why not be concentrated in Washington?

Mr. CROMWELL. Because of the difficulty of having the deeds, the instruments, brought over here or delivered here.

Senator MORGAN. They have been brought over, have they not?

Mr. CROMWELL. Afterwards; yes, sir.

Senator MORGAN. Yes. Why could they not have been brought as well then as later?

Mr. CROMWELL. For several reasons.

Senator MORGAN. State the reasons.

Mr. CROMWELL. It involves a topic that will require some length to state, but that is of interest. It was considered of the highest concern that the title be closed promptly, because the United States of Colombia, the Republic of Colombia, had brought suit in France to enjoin the transfer. The stockholders of the New Panama Canal Company had also brought suits to enjoin the transfer. Those suits were vigorously defended by the company and were defeated. Messrs. Day and Russell, the representatives of Attorney-General Knox, sent specially for the purpose, arrived to consummate the transaction; and as the company had succeeded in defeating this most grave litigation only a few days before the arrival of those gentlemen, it was of the highest national concern that no fresh opportunity should be furnished to the Government of Colombia, angry and discontented and defeated as it had been, to institute new litigation in the United States if we all had hurried back here to consummate it at this point.

Senator KNOX. Well, Mr. Cromwell, was not the real underlying reason the fact that this seven million and odd dollars, or practically \$7,000,000, of railroad stock was in the hands of trustees and the liquidator, and the money had to be paid in before it could be released, and it all had to be done there contemporaneously?

Mr. CROMWELL. Yes, sir; I was about to explain that.

Senator KNOX. As I have some responsibility about that, I would like you to be clear about it.

Mr. CROMWELL. You are quite right. I intended to refer to that, Senator. For this practical reason it was desirable to consummate the matter promptly. Now, the locus of the property——

Senator MORGAN. Let me interrupt you a moment before you proceed. Why was it necessary to have the money in Paris to pay into the hands of the liquidator of the old company?

Mr. CROMWELL. The shares of stock—the Panama Railroad shares, the most important element in this sale—were held in escrow, had been held for years in escrow, under an agreement between the old liquidator and the New Panama Canal Company, so that the New Panama Canal Company could not surrender those shares to the Attorney-General's representatives until payment was made; and it became necessary in order to secure physical possession of those shares that payment be made contemporaneously.

Senator MORGAN. To whom?

Mr. CROMWELL. To the liquidator of the old company.

Senator MORGAN. Who was he?

Mr. CROMWELL. Mr. Jean Pierre Gautron.

Senator MORGAN. Where was he?

Mr. CROMWELL. In Paris.

Senator MORGAN. Why could not he be here?

Mr. CROMWELL. He had no power to leave his jurisdiction, to take the property away from his jurisdiction.

Senator MORGAN. He would not have had to have brought any property with him, would he?

Mr. CROMWELL. He would have had to have brought the railroad shares; yes, sir.

Senator MORGAN. Oh, the shares.

Mr. CROMWELL. Yes, sir.

Senator MORGAN. What was his jurisdiction?

Mr. CROMWELL. His jurisdiction, Senator?

Senator MORGAN. Yes. You say he had no power to take it out of his jurisdiction.

Mr. CROMWELL. The jurisdiction was that he was an appointee of the civil tribunal of the Seine—analogous, Senator, to our receiver.

Senator MORGAN. And you undertake to say that those stocks could not have been brought here by an order of that court, do you?

Mr. CROMWELL. No, sir. The court never would have given an order to transmit.

Senator MORGAN. How do you know?

Mr. CROMWELL. Oh, all the lawyers said so.

Senator MORGAN. No effort was made?

Mr. CROMWELL. All the French lawyers advised that it would be impossible to take the risk of transmitting millions of property out of the jurisdiction of the court. For these reasons, therefore, it was necessary to make payment in Paris, and in order to accomplish——

Senator MORGAN. How much of the payment?

Mr. CROMWELL. The entire payment.

Senator MORGAN. The forty millions?

Mr. CROMWELL. Yes, sir.

Senator MORGAN. It was not all for railroad stock?

Mr. CROMWELL. No, sir.

Senator MORGAN. How much for railroad stock?

Mr. CROMWELL. There was no division of that.

Senator MORGAN. But how much was the railroad stock?

Mr. CROMWELL. The sale by the canal company to the United States was the totality, including the railroad shares, so, of course, the Attorney-General would not take it in part; he must take it in total, at one time.

Senator MORGAN. Did the liquidator receive the whole sum, forty millions of dollars?

Mr. CROMWELL. No, sir.

Senator MORGAN. How much did he receive?

Mr. CROMWELL. He received about twenty-five millions; the exact figures I have given you.

Senator MORGAN. How was that twenty-five millions ascertained and separated from the forty millions?

Mr. CROMWELL. There had been made, some months before that, a year or so before that—and all this appears in the full opinion of the Attorney-General upon the titles—there had been arrived at, in anticipation of the closing of the title, an agreement by arbitration between the old company and the liquidator as to a division of the fund; and that was submitted to the court, the same court appointing the receiver—the liquidator; and the court had ordered and authorized the liquidator to join in, concur in that agreement, and to deliver the shares upon receiving a given proportion of the whole, which was about twenty-five millions.

Senator MORGAN. Yes; twenty-five million out of forty?

Mr. CROMWELL. Yes, sir.

Senator MORGAN. Now, we understand that there was, apparently, at least, some necessity for having the money there?

Mr. CROMWELL. Yes, sir.

Senator MORGAN (continuing). To pay that twenty-five million of dollars in order to get possession of the railroad shares, and in order that they might be brought here, as they have been brought here.

Mr. CROMWELL. Yes, sir.

Senator MORGAN. Now, about the balance of the forty millions, why was it necessary to pay that in Paris?

Mr. CROMWELL. Oh, because it was one entire transaction.

Senator MORGAN. But it had been separated, you say?

Mr. CROMWELL. No; the deeds had not been separated; the consideration only had been, sir.

Senator MORGAN. "The consideration" means so much money?

Mr. CROMWELL. No; the payment could not be made—I mean the Panama Canal Company, in whom the title to all this rested, could not deliver the deed until it received the forty millions. The forty millions were paid to the Panama Canal Company, and it in turn gave an order on the United States directing it to pay out of the forty millions coming to the New Panama Canal Company twenty-five of it direct to the liquidator; so two accounts were opened with the Bank of France.

Senator MORGAN. All of this occurred after the ratification of the Hay-Varilla treaty?

Mr. CROMWELL. Yes, sir.

Senator MORGAN. After the ratification?

Mr. CROMWELL. Yes, sir.

Senator MORGAN. If either of these parties had failed or refused to comply with his separate and distinct part of this transaction, which made up the forty millions, would that have stopped the sale of the canal?

Mr. CROMWELL. If either of which parties, sir, may I ask?

Senator MORGAN. These parties you have just been talking about—the liquidator, the holder in escrow of the shares of stock, or those parties who were litigating with Colombia, as I understand it. If either of the parties concerned in interest in the forty millions of dollars had failed or refused to carry the contract into effect, to deliver the goods, to deliver the property, would that have broken up the transfer of the Panama Canal property to the United States?

Mr. CROMWELL. I do not think so.

Senator MORGAN. Why not?

Mr. CROMWELL. Because I think they were bound to do it, and I think they would have been forced to do it.

Senator MORGAN. If they were bound to do it and could have been forced to do it, why was it necessary to transact all of that business in Paris and at an expense to the parties, or at an expense to the Government of the United States?

Mr. CROMWELL. It was not an expense to the Government of the United States. All the expense was borne by the New Panama Canal Company and paid by it; and the reasons for making it in Paris were, as I have stated, because part of the property was there, and in order to get the part it was necessary to deliver the whole.

Senator MORGAN. Why was it necessary to send the Attorney-General of the United States and his subordinates, Messrs. Russell and Day, to Paris to consummate this contract, if the contract could have been and would have been carried into effect without that?

Senator KNOX. Well, I object to the witness answering that question. I will take the responsibility of answering that. I do not see how this witness can say why it was necessary for the Attorney-General to go there, or send his assistants, Senator. I thought it was necessary.

Senator MORGAN. I did not ask whether it was necessary.

Senator KNOX. Well, you asked why it was necessary. I think I can answer why it was necessary, if you want to put me under examination, but I do not think Mr. Cromwell ought to answer for me, Senator.

Senator MORGAN. I will have you examined if you want to be.

Senator KNOX. I do not; but I do not want anybody else to tell why I do things.

Senator MORGAN. Well, let any man who is a witness before this committee state the truth.

Senator KNOX. That is what I want him to do, and that is what I expect he will do; but I have not any desire to have Mr. Cromwell or any other gentleman tell why the Attorney-General of the United States did certain things.

Senator MORGAN. I am trying to ascertain why it was necessary for the Government of the United States to put this money into the hands of a fiscal agent to be sent to Paris, and the transaction to be consummated there fully and conclusively. That is what I am trying to get at.

Senator KNOX. I have no objection to that part of it at all.

Senator MORGAN. That is all I was trying to do.

Senator KNOX. It is only the specific question that you asked.

(By request of Senator Morgan, the stenographer thereupon read aloud the following question:)

“ Why was it necessary to send the Attorney-General of the United States and his subordinates, Messrs. Russell and Day, to Paris to consummate this treaty, if the treaty could have been and would have been carried into effect without that ? ”

Mr. CROMWELL. The New Panama Canal Company considered it necessary to close the transaction in Paris, and it of course became necessary for the United States to be represented there. All the reasons that relate to that subject can be best explained by the Department of Justice.

Senator MORGAN. Do you know the reasons?

Mr. CROMWELL. I do not.

Senator MORGAN. So far as you have gone, the New Panama Canal Company required that the transaction should be closed there?

Mr. CROMWELL. It did, and paid the expense of it.

Senator MORGAN. And that was the only reason you know of, personally?

Mr. CROMWELL. Yes, sir.

Senator MORGAN. For transferring the business entirely to Paris?

Mr. CROMWELL. Yes, sir.

Senator MORGAN. That business included the shipment of gold, did it not?

Mr. CROMWELL. It did, sir.

Senator MORGAN. How much of gold?

Mr. CROMWELL. Of the forty millions I believe thirty millions were transmitted in gold and ten millions in exchange.

Senator MORGAN. That transaction was conducted entirely by Morgan & Co.?

Mr. CROMWELL. Entirely.

Senator MORGAN. Do you know of any reason why the gold was transmitted to Paris?

Mr. CROMWELL. No, sir; I have no knowledge about any feature of that business.

Senator MORGAN. Do you know of the fact that part of that gold was reshipped to the United States?

Mr. CROMWELL. No, sir. I have no knowledge, Senator, about any other thing than the professional duty of making the arrangement; and as to its performance I had no part.

Senator KNOX. Do you know positively that thirty millions of gold was shipped from the United States?

Mr. CROMWELL. Messrs. Morgan & Co. have stated to me that of the forty millions, thirty millions was shipped in different shipments.

Senator KNOX. From the United States?

Mr. CROMWELL. From the United States.

Senator KNOX. The reason I ask you is that I had an understanding that a good deal of that gold was gathered up in Germany.

Mr. CROMWELL. I think perhaps ten millions of it was.

Senator KNOX. Yes; I did not think there was as much as that.

Mr. CROMWELL. About ten millions, I think.

Senator MORGAN. You do not know whether any of that same coin was reshipped to the United States?

Mr. CROMWELL. No, sir; I have no knowledge. I am sure Messrs. J. P. Morgan & Co. will be glad to tell you if you want to find out.

Senator MORGAN. I make that inquiry merely because it was stated in the newspapers at the time that it was.

Mr. CROMWELL. No, sir.

Senator MORGAN. I do not know whether it was so or not.

Mr. CROMWELL. The compensation received by them was insignificant, I know; and Mr. Morgan acted very handsomely about it.

Senator MORGAN. His compensation, you say, was insignificant?

Mr. CROMWELL. Yes, sir.

Senator MORGAN. How much was it?

Mr. CROMWELL. The report I have mentioned here is \$35,000.

Senator MORGAN. Is that all of it?

Mr. CROMWELL. All of it.

Senator MORGAN. Was that all that Morgan & Co. realized for handling that sum back and forth?

Mr. CROMWELL. They stated to me within a week that it was all that they received. Mr. Morgan told me that himself.

Senator MORGAN. That \$35,000 could have been saved to somebody if the payment had taken place in Washington?

Mr. CROMWELL. It could have been, but my client preferred to have it paid in Paris, and paid the bill. I do not see that it lies in the mouth of the United States to complain about it.

Senator MORGAN. No; we are not complaining of their paying the bills; we just want to know and understand the whole transaction. There is no use of concealing anything about it that I know of.

Mr. CROMWELL. No, sir; no, sir; I think not, either.

Senator KNOX. If it had been paid here, would not the exchange have had to be paid to have transmitted it to Paris?

Mr. CROMWELL. That is a very good question. I ought to have thought of that myself, Senator.

(By request, the question of Senator Knox was read aloud by the stenographer.)

Mr. CROMWELL. Yes, sir.

Senator MORGAN. That is, paid by the people?

Mr. CROMWELL. If the payment had been made here. The payment was, in legal effect, made here, but if the Canal Company had actually received the \$40,000,000 here in Washington, it of course would have had to transmit that money to Paris in some form, and you and I know there are only two ways of doing it—one by the actual transmission of the gold by shipment, and the other by the purchase of bills of exchange on Paris or on Europe, and that would have cost far more than \$35,000.

Senator TALIAFERRO. Would not that have been entirely a matter of agreement?

Mr. CROMWELL. With the parties transmitting it?

Senator TALIAFERRO. With the parties to the transaction.

Mr. CROMWELL. Yes, sir.

Senator TALIAFERRO. A matter of agreement between the United States Government and the Panama Canal Company?

Mr. CROMWELL. Well, sir, I suppose if the payment were made in the United States, Senator, the United States then would have had no concern whatever regarding its shipment.

Senator MORGAN. You say it would cost more to transship gold than it did to buy the exchange?

Mr. CROMWELL. No; I do not know about that.

Senator MORGAN. I understood you to say so.

Mr. CROMWELL. No, sir; I do not know how it would run. It would

be according to the rates; but it would have cost the company as much or more to transport the \$40,000,000 if it had received it here as it did by the arrangement which it made with Messrs. J. P. Morgan & Co.

Senator TALIAFERRO. But it would not necessarily have cost this Government anything? That is the point.

Mr. CROMWELL. No, sir; in neither way could it cost the Government anything, and in neither way did it cost the Government anything.

The CHAIRMAN. As I understand, Mr. Cromwell, it cost the Government nothing anyway?

Mr. CROMWELL. In neither way, Senator—in neither way did it cost the United States a millionth part of a cent.

Senator TALIAFERRO. I did not understand that.

Mr. CROMWELL. The \$40,000,000 was paid out of the Treasury of the United States to Messrs. J. P. Morgan & Co., of New York, as fiscal agents of the United States, under an agreement that it should be transmitted to the Bank of France in the way I have described, without expense to the United States; and it was so transmitted.

Senator KNOX. Was not this the fact, Mr. Cromwell, that it was in effect a payment to the Canal Company the moment it went into the hands of J. P. Morgan & Co., but the fiction of their being fiscal agents of the United States was devised in order to satisfy the French people, so that the Government should be back of the transaction until they actually got the cash?

Mr. CROMWELL. You are right, sir.

Senator KNOX. Is not that right?

Mr. CROMWELL. Absolutely right, Mr. Attorney-General; absolutely right.

Senator MORGAN. Then at the time the money was deposited by the United States Government in the hands of J. P. Morgan & Co., this matter was not settled about the railroad stock, whether it should be delivered or could be delivered?

Mr. CROMWELL. Yes, sir; every feature of it was agreed upon.

Senator KNOX. And the deliveries were made contemporaneously?

Mr. CROMWELL. Yes, sir; contemporaneously—all agreements had been accepted and deliveries made before the payment was made. In fact, Senator, the Canal Company did not get their money until two months after the Attorney-General had received all this property.

Senator MORGAN. Why?

Mr. CROMWELL. Because it took J. P. Morgan & Co. two months to transmit the money prudently and safely and without disturbing financial conditions.

Senator KNOX. I wish you could make that point a little more definite. Senator, if you will permit me, I will ask Mr. Cromwell this question: Is it not a fact that the French company treated the deposit with J. P. Morgan & Co. as a payment to them, as described in my previous question, and immediately delivered over to the representatives of the United States in Paris at the time the money was paid to Morgan this railroad stock and all of the other evidences of property, and made a deed to all of their concessions and property on the Isthmus?

Mr. CROMWELL. Senator, that is absolutely correct; and I may amplify slightly by saying—though I could not state it better than the

form in which the question was put—that recognizing the solicitude of the Attorney-General that the transmission of such a vast sum as forty millions at one moment might disturb commercial affairs, the condition was imposed by the Attorney-General that this money should not be transmitted in a single flash, which, as I say, would disturb great interests in America; but that the canal company would accept J. P. Morgan & Co.'s agreement to transmit it in installments that would reach them within a period of sixty days.

But it was, nevertheless, agreed that the moment the United States paid that forty millions to J. P. Morgan & Co. the documents should be delivered, and they were then and there delivered, possession given, cables sent to the Isthmus, and physical possession given to the representatives of the Government upon the Isthmus; the shares were physically delivered on the spot, the deeds and all other documents were contemporaneously delivered, all before the New Panama Canal Company received one farthing of the forty millions.

Senator DRYDEN. Could the American business and commercial interests have been protected, as you have described, if the other method of payment which Senator Morgan has questioned you about had been adopted by the Government's warrants being delivered in Paris?

Mr. CROMWELL. I think not, Senator, because—

Senator TALIAFERRO. That is purely a matter of opinion, is it not?

Mr. CROMWELL. Only to this degree, sir, that if the money had been paid directly to the canal company in Washington, the forty millions, then it would not have had any obligation to delay the transmission, but would have transmitted it in its own way, at its own pleasure, and instantly, if you please, without any regard to the public interests; but the canal company was as solicitous and as courteous as you could wish it to be in not doing anything that would unduly disturb conditions in America, and it really lost interest, in part, for sixty days.

Senator TALIAFERRO. The question of the effect of this financial matter of transmitting that forty millions all at once is simply one of opinion?

Mr. CROMWELL. Yes, sir; one of opinion, Senator; but experience teaches a good deal, as you know, and that has been found by experience. I do not pretend to be an expert; but it has been found by experience that the great and sudden shipment of \$40,000,000 out of the United States to-day—if you did it—

Senator KNOX. Was there not a great deal of apprehension expressed in the newspapers at that time that the movement of that much gold would create trouble, and was it not generally conceded that the Government ought to take every precaution in order to prevent any possible trouble?

Mr. CROMWELL. That was the view. The public press and, I know, Secretary Shaw were most solicitous about that, as was the President and all concerned—that this money should not be transmitted hastily.

(The committee thereupon took a recess until 2.30 o'clock p. m.)

AFTER RECESS.

TESTIMONY OF WILLIAM NELSON CROMWELL, ESQ.—Continued.

Senator MORGAN. I was inquiring of you, as I remember, as to the reason that made it necessary to have the disbursement or distribution of these forty millions of dollars in Paris, and you have stated that all of it has not as yet been disbursed or paid out?

Mr. CROMWELL. By the recipients.

Senator MORGAN. It has not yet been paid out by the canal company?

Mr. CROMWELL. Yes, sir.

Senator MORGAN. There is a residuum left there in favor of certain persons?

Mr. CROMWELL. In favor of the corporation.

Senator MORGAN. And that residuum has been apportioned out in favor of certain persons?

Mr. CROMWELL. I did not say, sir, that it had been apportioned out at all.

Senator MORGAN. You said that a certain amount of this money had been paid out to the stockholders?

Mr. CROMWELL. Yes, sir; twelve millions of the fifteen have been paid out to the stockholders.

Senator MORGAN. There are three millions, then, due to the stockholders?

Mr. CROMWELL. The \$3,000,000 fund remaining; yes.

Senator MORGAN. Are you one of the stockholders?

Mr. CROMWELL. No, sir.

Senator MORGAN. Who are those stockholders?

Mr. CROMWELL. I do not know, sir. They number several thousand.

Senator MORGAN. Do you know any of them?

Mr. CROMWELL. No, sir; but I know that there are groups of large interests.

Senator MORGAN. Who are the possessors or the owners of the large interests of the stock?

Mr. CROMWELL. I do not know, Senator. I have no interest in the subject one way or the other.

Senator MORGAN. Why was that \$3,000,000 left there?

Mr. CROMWELL. I do not know, sir. That is a matter of current administration of the company. I had nothing to do with that.

Senator MORGAN. It looks as if it was very uncurrent. Is it usual and ordinary that the sum of \$3,000,000 is left hung up in the treasury of a corporation that is due to its stockholders, and that they are not making any demands for it?

Mr. CROMWELL. The stockholders seem to be satisfied, sir.

Senator MORGAN. Do you not know the whole of that situation and the reason for it?

Mr. CROMWELL. Absolutely not, Senator, any more than I have told you; absolutely not. I have no care about it.

Senator MORGAN. As general counsel of the company have you advised the holding up of this?

Mr. CROMWELL. I am not general counsel of the company in France. I am only the counsel in America. They have able counsel in France.

Senator MORGAN. Are any of those stockholders Americans?

Mr. CROMWELL. None that I know of.

Senator MORGAN. Has the payment been made in full out of this fund to the liquidator of the old company?

Mr. CROMWELL. Twenty-five millions; as I have several times stated, was paid into the bank of France to the credit of the liquidator of the old company, and he has paid out and declared dividends to the seven hundred thousand or eight hundred thousand parties concerned in it; he has paid out \$24,000,000 of it.

Senator MORGAN. Seven or eight hundred thousand parties?

Mr. CROMWELL. Yes, sir.

Senator MORGAN. What kind of parties? Bondholders or stockholders?

Mr. CROMWELL. Bondholders, I suppose. I have no concern about it. It is none of my business.

Senator MORGAN. He has not reached the stockholders yet, in the old company?

Mr. CROMWELL. I do not know, sir. It is not of the least concern to me.

Senator MORGAN. You know a good many things that are not any concern to you, do you not?

Mr. CROMWELL. I do not know that, sir. I have no interest in it. It is no concern of mine.

Senator MORGAN. A portion of that fund is still in the treasury in the hands of the old company and a portion of it is in the hands of the new company to be yet disposed of?

Mr. CROMWELL. Each company is in liquidation, each company has a reserve fund for the payment of whatever obligations it may have remaining and for final distribution to its security holders.

Senator MORGAN. In one of the purchases or extensions or prolongations of concessions made by Colombia to the New Panama Canal Company the sum of \$1,000,000, or 5,000,000 francs, was issued in stocks to Colombia?

Mr. CROMWELL. Yes, sir.

Senator MORGAN. That stood in the place of a payment of money?

Mr. CROMWELL. They had agreed to pay \$12,500,000—\$7,500,000 in cash and 5,000,000 francs in the form of these shares, all of which have been paid.

Senator MORGAN. The shares have been paid?

Mr. CROMWELL. I say, all of which sum was paid. The francs have been actually paid and delivered, and the shares stand in the name of the Republic of Colombia and are now in litigation in France.

Senator MORGAN. I thought you stated yesterday or to-day that that litigation had been terminated?

Mr. CROMWELL. That is a different litigation entirely.

Senator MORGAN. What was that litigation about that you spoke of then?

Mr. CROMWELL. The one I spoke of yesterday, sir, was a suit to enjoin the property transferred from the New Panama Canal Company to the United States.

Senator MORGAN. That was determined against Colombia?

Mr. CROMWELL. That was determined against Colombia.

Senator MORGAN. By what court?

Mr. CROMWELL. By the tribunal of the Seine.

Senator MORGAN. Is that the highest jurisdiction in France?

Mr. CROMWELL. No, sir.

Senator MORGAN. Is that case pending on appeal?

Mr. CROMWELL. No, sir; they never carried it forward.

Senator MORGAN. Have they a right to carry it forward now?

Mr. CROMWELL. No, sir; the time has expired.

Senator MORGAN. There is a limitation?

Mr. CROMWELL. Absolutely; and the formal documents of the expiration of that period have been filed with the Attorney-General.

Senator MORGAN. This other liquidation by Colombia for her quota or aliquot part of the dividends coming upon that five million of stock is still pending and undecided?

Mr. CROMWELL. It is still pending, undecided, under these conditions. It is still pending and undecided; yes.

Senator MORGAN. State the conditions, if there are any.

Mr. CROMWELL. I can tell you. The Republic of Colombia brought another suit than those I have mentioned against the canal company for the physical delivery of these five million francs stock. They had not theretofore been physically delivered to Colombia. After the independence of Panama Colombia demanded them. The New Panama Canal Company refused then to deliver to Colombia, upon the ground that Colombia had no title to the shares, in that sovereignty had passed from Colombia to the new Republic of Panama.

Senator MORGAN. And that Panama had the title, and not Colombia?

Mr. CROMWELL. And that Panama had an interest in the question. They did not assert that it had title, but that it had an interest in the subject. Then it was that the Republic of Panama was summoned into court as a third party—somewhat analagous, Senator, to the proceedings of intervention—

Senator MORGAN. I understand the procedure very well.

Mr. CROMWELL. I am sure you do. They were summoned into court as a third party, and they appeared and first asserted their right as a Republic, in succession to these identical shares. The subject was referred to me by the Republic of Panama. I examined it carefully, both in Paris with the French counsel there, and subsequently here, and I reached the conclusion that, in honor and equity, those shares should be delivered to Colombia. Upon my decision the Republic of Panama abided, and formally, in court, renounced their demand and claim for these shares which theretofore they had asserted, and consented that the shares be delivered to Colombia.

Senator MORGAN. Colombia is now the holder of those shares?

Mr. CROMWELL. Yes, sir. So far as Panama is concerned, its claim is, therefore, waived and renounced, and it seems that a third complication has arisen, with which I have no part or concern, and only speak to you of by way of narrative, that the public authorities of France—we call them the taxing officers—have asserted a claim against those shares as a taxing fee, claiming a large sum in respect of them.

Senator MORGAN. A taxing fee against whom?

Mr. CROMWELL. Against Colombia. So that the shares are impounded, awaiting the determination of the suit of the taxing department of France against those shares, in which, however, as I say, we have no personal concern. So far as Panama is concerned, it has generously

waived its claim, its right, in order to make composure of an international character, and to do all we could do to remove grounds of friction and disturbance between these Governments.

Senator MORGAN. In the transfer of this property to the United States, did this Government get anything more than the rights that belonged to the Panama Canal Company?

Mr. CROMWELL. You, of course, sir, include the shares of the Panama Railroad there?

Senator MORGAN. If you will answer the questions I will let you know.

Mr. CROMWELL. Yes, sir.

Senator MORGAN. What did she get more than that? You say she did get more?

Mr. CROMWELL. I beg pardon. I said she got, besides the property of the Panama Canal, the shares of the Panama Railroad Company. I was explaining—

Senator MORGAN. You meant that?

Mr. CROMWELL. Yes, sir.

Senator MORGAN. Did she get anything else besides the shares of the Panama Railroad Company?

Mr. CROMWELL. And the property of the Panama Canal Company.

Senator MORGAN. And the property of the Panama Canal Company; yes.

Mr. CROMWELL. And the concessions.

Senator MORGAN. And the concessions?

Mr. CROMWELL. Yes, sir. Nothing else, of course. That included all the property.

Senator MORGAN. Then, according to your statement, if I understand it, Colombia is still an owner of how many shares?

Mr. CROMWELL. Five million francs.

Senator MORGAN. Five millions of francs?

Mr. CROMWELL. Yes, sir.

Senator MORGAN. Of shares in the New Panama Canal Company?

Mr. CROMWELL. Yes, sir; the total capital of which company is 65,000,000 francs. I do not admit by my reply, Senator, and I do not wish to admit that Colombia is the real owner of those shares. I do not pass upon that question.

Senator MORGAN. I do not want anything but the facts. I am not asking for your opinions at all.

Then those shares, by the consent of Panama, have been issued to Colombia?

Mr. CROMWELL. They have not been issued to Colombia, for the reasons I have mentioned—that they stand under an injunction in the courts. So far as Panama is concerned it has renounced and waived its right or claim to those shares.

Senator MORGAN. Yes. And thereupon the French Government, under some claim or right of taxation against Colombia, has impounded or enjoined those shares—in whose hands? In the hands of the company?

Mr. CROMWELL. Yes, sir. They still remain in the physical custody of the company, subject to this injunction and these contentions. I am not pretending to be precise as to the exact status of that taxation

suit, because I have no part in it and no concern in it and have only heard of it from general correspondence. I have no duty regarding it.

Senator ANKENY. For how much does this garnishment lie?

Mr. CROMWELL. The claim?

Senator ANKENY. For how many francs?

Mr. CROMWELL. Almost as much as the shares themselves.

Senator ANKENY. Thank you.

Senator MORGAN. Do you know of any fact or reason why those shares have not passed to the United States under the Bunau-Varilla treaty?

Mr. CROMWELL. Why, they have no concern with the question.

Senator MORGAN. Nothing at all?

Mr. CROMWELL. No, sir; I think not.

Senator MORGAN. The United States stipulated in its treaty with Colombia to pay that money, did they not?

Mr. CROMWELL. No, sir.

Senator MORGAN. You say there was no stipulation in the Hay-Herran treaty for the payment of that five million?

Mr. CROMWELL. There is no such thing as the Hay-Herran treaty.

Senator MORGAN. Well, assume that there is.

Mr. CROMWELL. I can not see how we can imagine what does not exist.

Senator MORGAN. It does exist, and does exist as a fact.

Mr. CROMWELL. It does not exist as a fact.

Senator MORGAN. How does it exist?

Mr. CROMWELL. Only as a project.

Senator MORGAN. It was ratified by the Senate of the United States and rejected by Colombia?

Mr. CROMWELL. And therefore is not a treaty.

Senator MORGAN. And concluded by agreement between the two Governments?

Mr. CROMWELL. And therefore is not a treaty.

Senator MORGAN. I shall not quibble about words. I think that both of us have more to do than to quibble about definitions.

Did not the Government of the United States undertake, in that treaty, to pay that money?

Mr. CROMWELL. No, sir.

Senator MORGAN. That million of dollars?

Mr. CROMWELL. No, sir.

Senator MORGAN. That stood for those shares?

Mr. CROMWELL. No, sir.

Senator MORGAN. It did not?

Mr. CROMWELL. It did not.

Senator MORGAN. We shall have to appeal to the treaty to decide that question.

Mr. CROMWELL. We shall; and it will very quickly dispose of it. Please produce it.

Senator MORGAN. We will not take it up just now, but I will call attention to it in due season and in due order.

Mr. CROMWELL. I think I know what you refer to, Senator. That is not the case, Senator. Allow me to state from memory, subject, of course, to the words which you want to refer to as well as myself, that the treaty provided that Colombia in signing the treaty did not waive

its right to have its benefit as a stockholder of the Panama Canal Company in respect of those 500 shares. That is all.

Senator MORGAN. Well, come to the question as to whether it was to be paid in money or not.

Mr. CROMWELL. The United States took no obligation recorded under the Hay-Herran proposed treaty.

Senator MORGAN. Do you know anything about this tax that was levied by France upon Colombia?

Mr. CROMWELL. No, sir.

Senator MORGAN. You know nothing of the items?

Mr. CROMWELL. I do not, except as I have answered, Senator. I know it was very large and that it would about eat up the shares, so to speak, if the claim was sound.

Senator MORGAN. Was that a tax upon the interest of Colombia in the New Panama Canal Company?

Mr. CROMWELL. I frankly can not tell you. I have no interest in the affair.

Senator MORGAN. Was it a tax in any wise connected with the operations of the New Panama Canal Company or Colombia's relations to that company?

Mr. CROMWELL. It is a tax upon the so-called registration, or a transfer-fee tax.

Senator MORGAN. Transfer of what?

Mr. CROMWELL. Of the concessions and of the original organization.

Senator MORGAN. Concessions to the United States?

Mr. CROMWELL. No; the concessions to the Panama Canal Company and from them to the United States.

Senator MORGAN. And from them to the United States?

Mr. CROMWELL. From them to the United States.

Senator MORGAN. That is, the transfer of the concessions from the old Panama Canal company or liquidator of the concessions, that is, the Wise concessions, and these other concessions, prolongations of it, and also the transfer of these concessions to the United States?

Mr. CROMWELL. Something of that kind, Senator. As I say, I have no interest in the question, and I can not state.

Senator MORGAN. Who was the attorney in France that conducted this business?

Mr. CROMWELL. I do not know.

Senator MORGAN. You do not know anything about that?

Mr. CROMWELL. No, sir; I have no concern or interest in it, Senator.

Senator MORGAN. So that Colombia is still being charged by France for the transfer of these concessions from the New Panama Canal Company to the United States?

Mr. CROMWELL. I do not know whether they are charged with any transfer to the United States. There is some such—

Senator MORGAN. You stated it just now. I do not know what you mean when you state a thing and then say you do not know it.

Mr. CROMWELL. I do not know the precise terms.

Senator MORGAN. Maybe not. Do you know the fact?

Mr. CROMWELL. No, sir; I do not know the fact. I have told you so.

Senator MORGAN. What are you talking about it for, then, if you do not know anything about it?

Mr. CROMWELL. I have tried to tell you that I do not know precisely.

Senator MORGAN. You say "precisely" again. Do you know at all?

Mr. CROMWELL. I do not know at all the exact nature of the litigation, and I have no concern or care about it, as I told you.

Senator MORGAN. Your cares and your concerns are matters that this committee have nothing to do with. I speak of the United States, and I want to know—

Mr. CROMWELL. By care or concern I mean to say that I have no duty or responsibility in the matter.

Senator MORGAN. I want to know how you ascertain and whether you do know or not that the Government of France impounded or enjoined Colombia from receiving her shares of stock in the Panama Canal Company?

Mr. CROMWELL. I do not know.

Senator MORGAN (continuing). On the ground that France had a tax against that new Canal Company for the transfer made to it by the old company and by the transfers made by it to the United States?

Mr. CROMWELL. I do not know, sir.

Senator MORGAN. You put the fact in before the committee on your memory or your statement or your knowledge, or something of the kind. Were you imagining a situation? You say you do not know.

Mr. CROMWELL. I do not know, sir.

Senator MORGAN. Were you imagining the situation?

Mr. CROMWELL. I have told you all I do know, Senator.

Senator MORGAN. You have told facts here, or what purport to be facts?

Mr. CROMWELL. Yes; I have.

Senator MORGAN. I suppose I shall have to accept them. Then the situation is this: That the Government of France is litigating with the Government of Colombia as to the ownership of these shares of stock.

Senator KITTREDGE. How is that material, Senator Morgan, to our inquiry?

Senator MORGAN. I do not think I would have drawn it in as a necessarily material matter, but the witness has stated it, and it has produced on my mind a necessary and proper and just inquiry as to the state of the facts. Besides that, it shows that the Government of the United States, while getting nominally all of the property of the New Panama Canal Company, and necessarily all of its stock—necessarily so, because it can not hold the property of a corporation without holding its stock, unless it is under a decree that cuts the stockholders off, and no such decree has been produced in this case—that the United States has been paying money there for property it has not got.

Senator KITTREDGE. Do you claim that this Government secured any stock in the New Panama Canal Company?

Senator MORGAN. I claim that this Government has a right to say to every stockholder in the company that it has bought the whole establishment from the company and has thereby extinguished, so far as it is concerned, all stock in that company.

Senator KITTREDGE. In what respect has this Government anything to do with that liquidation?

Senator MORGAN. In paying for the property that was included we were to get all the rights of the Panama Canal Company of every kind and character.

Senator KITTREDGE. And did?

Senator MORGAN. No; we did not. We did not. We lack \$1,000,000 of it.

Senator KITTREDGE. What million dollars do you refer to? What property do you refer to?

Senator MORGAN. I refer to the property that stood in the place of money—so many shares, in francs, of the canal company were transferred to Colombia in consideration of the extension of these concessions. That is what I refer to.

Mr. CROMWELL. The Panama Canal Company does not claim these shares.

Senator MORGAN. How do you know?

Mr. CROMWELL. I know, as counsel, from an examination of the records in the case to which I refer.

Senator MORGAN. You have read the records?

Mr. CROMWELL. In the original case to which I refer.

Senator MORGAN. You have read the records?

Mr. CROMWELL. In the original case to which I refer, yes.

Senator MORGAN. You have read the records?

Mr. CROMWELL. That record I have read.

Senator MORGAN. What do you mean by the original case to which you refer?

Mr. CROMWELL. The one in which Colombia sought to obtain an injunction in Paris.

Senator MORGAN. Have you read the records in the other case, the tax case?

Mr. CROMWELL. No, sir; that transpired subsequently.

Senator MORGAN. We were talking about the tax case.

Mr. CROMWELL. That transpired subsequently.

Senator MORGAN. That is what we were talking about. You knew very well that we were talking about that, and you tried to switch off to the other.

Mr. CROMWELL. Do you not want to know about the other?

Senator MORGAN. I know as much about that as I can get from you, I think.

Are there any other matters between Colombia and the Panama Canal Company that are not settled; any other claims or demands?

Mr. CROMWELL. I know of none, sir.

Senator MORGAN. Has Colombia, within your knowledge, ever waived in favor of the United States, or transferred to the United States, any of her rights that arose under the concessions made by her to Wise, or any prolongation of those concessions?

Mr. CROMWELL. I know of no agreements between the United States and Colombia.

Senator MORGAN. Her rights are supposed to have been terminated entirely by the transfer of sovereignty?

Mr. CROMWELL. Yes, sir; with the exception of her right to the Panama Canal Company shares to which we have referred.

Senator MORGAN. Why were not those rights transferred to the United States?

Mr. CROMWELL. Because, except the rights of Colombia, or I should say the claims of Colombia—

Senator MORGAN. You said rights.

Mr. CROMWELL. Strike out the word "rights." I do not admit that they had any—the claims of Colombia in respect to those shares.

Senator MORGAN. That has not been transferred in any way?

Mr. CROMWELL. The United States has no interest in it.

Senator MORGAN. No transfer of the sovereignty has brought those rights into the hands of the United States?

Mr. CROMWELL. I think not.

Senator MORGAN. How about the annual stipend or sum that the railway company was required to pay to Colombia for the privileges that they were enjoying as tenants under the lease? Have they been paid to Colombia?

Mr. CROMWELL. No, sir.

Senator MORGAN. Have they been paid to Panama?

Mr. CROMWELL. To the United States.

Senator MORGAN. By the railroad company?

Mr. CROMWELL. Yes, sir.

Senator MORGAN. How did they get to be transferred?

Mr. CROMWELL. Under the terms of the treaty, article-22.

Senator MORGAN. Terms or effects?

Mr. CROMWELL. Under the terms of the treaty.

Senator MORGAN. Does the treaty contain a term in it that requires the payment of that railroad stipend to the United States?

Mr. CROMWELL. I think it does, sir.

Senator MORGAN. Expressed terms?

Mr. CROMWELL. I think it does, sir.

Senator MORGAN. I have not seen that.

Mr. CROMWELL. Would you like me to show it to you?

Senator MORGAN. At the proper time and at my convenience I shall be glad to confer with you about matters of that kind. I think I can find it, however.

Mr. CROMWELL. I shall be happy to do it.

Senator MORGAN. That brings back the question as to who ordered that payment.

Mr. CROMWELL. Which payment?

Senator MORGAN. The payment of the annual stipend by the railway company to the United States.

Mr. CROMWELL. You mean, sir, the \$25,000 per annum?

Senator MORGAN. Yes.

Mr. CROMWELL. The board of directors of the Panama Railroad Company.

Senator MORGAN. By an order?

Mr. CROMWELL. Certainly.

Senator MORGAN. When was that done?

Mr. CROMWELL. Each successive annual period.

Senator MORGAN. How many years?

Mr. CROMWELL. Two years, I think, have intervened.

Senator MORGAN. There has been an order, then, each year?

Mr. CROMWELL. Yes, sir.

Senator MORGAN. By the board?

Mr. CROMWELL. By the board.

Senator MORGAN. A payment of \$25,000 to the United States for the lease of the property to the Panama Railroad?

Mr. CROMWELL. No, sir; will you permit me to explain?

Senator MORGAN. Yes.

Mr. CROMWELL. Under the concession, Senator, it was provided that there should be paid by the Panama Railroad Company to Colombia \$250,000 per annum.

Senator MORGAN. Well?

Mr. CROMWELL. Of which \$225,000 should be paid directly to the main Government at Bogota and \$25,000 to the Province of Panama.

Senator MORGAN. Yes.

Mr. CROMWELL. As to the \$225,000 payable to the government direct, the Government of Colombia anticipated that right for a period of thirty years: away back in 1887, I think, sir, they anticipated 27 annual periods of that sum, aggregating a total of \$3,000,000, and requested the railroad company to issue for it, in anticipation, the subsidy bonds which you see in our annual report.

Senator MORGAN. The gold subsidy bonds?

Mr. CROMWELL. The gold subsidy bonds, yes, sir. It was of no consequence to the railroad corporation because the exact amount was so amortized and calculated as that by the annual drawings and the annual interest it would always equal \$225,000 a year. So that it only operated as an advance to the Colombian Government. That runs out in the year 1911. It always has been pursued by the company every year and is being pursued to-day and will so go on until the year 1911. That disposes, for all our present experiences, of two hundred and twenty-five of the two hundred and fifty thousand dollars.

Senator MORGAN. All of that debt, then, thus readjusted and, I will say, compromised or settled—

Mr. CROMWELL. No, sir; not compromised or settled. It was just simply anticipated.

Senator MORGAN. You can have your own word about it; but I will call it compromised or settled, and you may call it anticipated.

Mr. CROMWELL. That was the language of the agreement. I am using the language of the agreement.

Senator MORGAN. I have not heard that you have made any dictionaries. If I knew of one, I would go to it, in order that I might have some understanding of the English language.

Mr. CROMWELL. My dear sir, I expect you to make a dictionary before you die.

Senator MORGAN. If I do, I will not put your ideas into it if I can keep them out. [Laughter.]

Mr. CROMWELL. I think it will have a small sale then. I sympathize with you. [Laughter.]

Senator MORGAN. I do with you, too. That \$250,000 thus distributed in \$25,000 annual payments was at last arranged so that it stood for three million of dollars in gold?

Mr. CROMWELL. Two hundred and twenty-five thousand dollars of the \$250,000 per annum was thus amortized in the way I have described, until it stood for \$3,000,000 in gold.

Senator MORGAN. For which gold bonds were issued?

Mr. CROMWELL. Yes, sir.

Senator MORGAN. By the railroad company?

Mr. CROMWELL. Yes, sir.

Senator MORGAN. Payable to whom?

Mr. CROMWELL. To bearer; to anybody; to the public.

Senator MORGAN. There was no gold obtained upon those bonds, was there, at all?

Mr. CROMWELL. No gold!

Senator MORGAN. By the company?

Mr. CROMWELL. No, sir; the company received no money. The

company delivered these promissory notes in advance for twenty-seven years and some months.

Senator MORGAN. For the Government of Colombia?

Mr. CROMWELL. Yes, sir.

Senator MORGAN. In full settlement of that transaction?

Mr. CROMWELL. In full settlement for twenty-seven years and some months.

Senator MORGAN. And that was the only consideration for these gold bonds?

Mr. CROMWELL. Yes, sir; ample consideration—exactly the same as if you bought a house and made a payment and gave a man notes in advance for the balance.

Senator MORGAN. Have you any of those gold bonds?

Mr. CROMWELL. No, sir.

Senator MORGAN. Are they a part of the investment of the company?

Mr. CROMWELL. No, sir.

Senator MORGAN. What gold bonds were mentioned as being part of the investment?

Mr. CROMWELL. Those are the bonds recently issued—the 4½ first-mortgage bonds.

Senator MORGAN. Issued when?

Mr. CROMWELL. Issued in 1897 or 1898.

Senator MORGAN. Do you know who are the holders of these three millions of bonds, or any of them?

Mr. CROMWELL. There are not very many left, Senator, now.

Senator MORGAN. They are extinguished?

Mr. CROMWELL. Yes, sir; they are nearly all retired.

Senator MORGAN. What is the amount outstanding upon that issue of bonds?

Mr. CROMWELL. I will put the figures in my testimony. I can not tell you. If you will permit me—

Senator MORGAN. About how much?

Mr. CROMWELL. Has anybody an annual report of our railroad company here?

Senator TALIAFERRO. The last annual report?

Mr. CROMWELL. Yes, sir.

Senator TALIAFERRO. Here it is. [Handing document to Mr. Cromwell.]

Mr. CROMWELL. Thank you, sir. There are only \$715,000 of the subsidy bonds now outstanding, and those will be retired in regular course at the expiration of the period. I thank you, Senator Taliaferro.

Senator MORGAN. What is the rate of interest on those?

Mr. CROMWELL. Six per cent.

Senator MORGAN. Who is paying the interest on them annually?

Mr. CROMWELL. The Panama Railroad. The interest is all amortized as a part of the original \$225,000. It therefore does not pay anything in addition. The face value of the bonds carries all the interest calculated in, so that the Panama Railroad, by retiring each year about 140 or 150 thousand of those bonds thereby pays the interest upon the balance, and thereby pays the exact equivalent of the \$225,000. It comes out within a few dollars. We all understand that, as a financial proposition. It neither increases nor decreases the obligation of the Panama Railroad one farthing. It was done entirely

for the convenience of the Colombian Government. If we did not pay them in the form of retiring these bonds annually we would have to draw a check for \$225,000. It makes no difference whether we do it by recalling so many bonds or whether we draw checks.

Senator MORGAN. Does the Colombian Government own any of these bonds?

Mr. CROMWELL. I do not know, sir, anything about the ownership of them. It is no concern of mine.

Senator MORGAN. You never have known about the ownership of any of those bonds?

Mr. CROMWELL. No, sir. They are owned by the public—anybody, Senator. The \$3,000,000 have now been reduced by that annual drawing down to \$715,000.

Senator MORGAN. That settlement excluded Colombia from further participation in this annual contribution?

Mr. CROMWELL. Yes, sir; up to 1911.

Senator MORGAN. Up to 1911?

Mr. CROMWELL. When these bonds expire.

Senator MORGAN. Then, after 1911, what is the interest of Colombia in it?

Mr. CROMWELL. It has none, because it has lost all its interest in the whole affair by the transfer of sovereignty.

Senator MORGAN. Yes. That does not take effect until 1911?

Mr. CROMWELL. No, sir.

Senator MORGAN. So that there is still something overhanging that has got to be determined in 1911?

Mr. CROMWELL. Nothing. Colombia has no interest in the subject any more.

Senator MORGAN. Colombia has no further interest in it?

Mr. CROMWELL. No, sir.

Senator MORGAN. Has she any claims?

Mr. CROMWELL. I do not know whether she has or not.

Senator MORGAN. You have not thought that was worth while to attend to, at all?

Mr. CROMWELL. It has not come up as a practical subject.

Senator MORGAN. The railroad company keeps on paying?

Mr. CROMWELL. Yes, sir; of course.

Senator MORGAN. To the United States?

Mr. CROMWELL. It keeps on redeeming these bonds.

Senator MORGAN. No.

Mr. CROMWELL. Yes, sir; it keeps on redeeming.

Senator MORGAN. Very good; redeeming the bonds, but still paying its \$25,000 in addition to the redemption of the bonds?

Mr. CROMWELL. Yes, sir.

Senator MORGAN. Our property, then, is held subject to this transaction that was made between Colombia and the Panama Canal Company or the railroad company?

Mr. CROMWELL. Yes, sir; quite so.

Senator MORGAN. We own the railroad absolutely, do we not?

Mr. CROMWELL. Of course, you know—you do not mean that, speaking as a lawyer? You mean that in colloquial terms we own it?

Senator MORGAN. Is there anything about it that we do not own?

Mr. CROMWELL. No, sir; I am speaking only as a matter of law. Of course the United States does not own the railroad.

Senator MORGAN. Is there any piece of property down there belonging to the railroad company that we do not own?

Mr. CROMWELL. It is all covered by the capital stock of the corporation, and the United States Government owns every single share of that capital stock.

Senator MORGAN. It is covered by the capital stock?

Mr. CROMWELL. Yes, sir.

Senator MORGAN. But we have also got the actual possession of all the property that belongs to that railroad?

Mr. CROMWELL. The railroad has possession of its own property, and the United States Government has possession of the railroad through the ownership of the stock.

Senator MORGAN. Yes. Well, it is hard to divide between the two. The railroad owns the property?

Mr. CROMWELL. How is it, any more than it is to consider the ownership of a bank? Suppose you own some shares in the stock of a bank. If you own all the shares, you do not own the bank, but you own the shares.

Senator MORGAN. If you own the bank and all the money in the bank and all its cash—

Mr. CROMWELL. You can not if you own the shares.

Senator MORGAN. You can not?

Mr. CROMWELL. No, sir; of course not. You can not violate law and disregard the legal relations. Of course not.

Senator MORGAN. We seem to have done it.

Mr. CROMWELL. We have done nothing of the kind. We have preserved it with greatest respect. The United States has preserved its status.

Senator MORGAN. The United States owns all the stock?

Mr. CROMWELL. Yes.

Senator MORGAN. And all the stock covers all the property?

Mr. CROMWELL. Yes.

Senator MORGAN. And the United States is not the owner of the property, either in law or in equity?

Mr. CROMWELL. I did not say in equity.

Senator MORGAN. I am asking about law and equity both.

Mr. CROMWELL. I was talking of law.

Senator MORGAN. Let us talk about both.

Mr. CROMWELL. I am quite willing.

Senator MORGAN. The United States owns all the stock?

Mr. CROMWELL. Yes, sir.

Senator MORGAN. And the stock covers all the property?

Mr. CROMWELL. That is right.

Senator MORGAN. How is it that the United States, either in law or in equity, is not the owner of the stock and property?

Mr. CROMWELL. Because there is a legal entity intervening, and that legal entity is the Panama Railroad corporation, a regularly chartered corporation of the State of New York, having its duties to the State of New York, its duties as a common carrier, and all the obligations of a corporation.

Senator MORGAN. Is it that legal entity that you represent as a director?

Mr. CROMWELL. I am a director, one of the thirteen; yes, sir.

Senator MORGAN. Representing that legal entity?

Mr. CROMWELL. Representing that corporation, that legal entity.

Senator MORGAN. How about the legal entity you have just described? Do you represent that?

Mr. CROMWELL. I am one of thirteen directors of that legal entity.

Senator MORGAN. How much stock do you own in the railroad?

Mr. CROMWELL. One share, sir.

Senator MORGAN. I thought you said that the United States owned it all?

Mr. CROMWELL. I will now proceed to describe to you how I own that one share.

Senator MORGAN. No; you said yesterday very emphatically, and repeated it two or three times, that the United States owned every share of the stock in that company?

Mr. CROMWELL. It does own every share.

Senator MORGAN. Then, if it belongs to the United States, it does not belong to you.

Mr. CROMWELL. I told you, also, that I would describe to you how we had qualified the thirteen directors.

Senator MORGAN. How you had prepared them for office?

Mr. CROMWELL. Yes, sir.

Senator MORGAN. Let us see how that was done. That is a process that I wanted to understand.

Mr. CROMWELL. I will tell you how that was done. Under the laws—and I question the wisdom of my making this statement, as a matter of public record, but I am called upon to do it —

Senator MORGAN. It is always wiser to tell the truth, if you can do it.

Mr. CROMWELL. It is sometimes imprudent to disclose your affairs to the public.

Senator MORGAN. Yes.

Mr. CROMWELL. But the responsibility is upon you and not upon me for that.

Senator MORGAN. You are not under any professional obligation not to do it?

Mr. CROMWELL. No, sir.

Senator MORGAN. Go ahead, then. That is the first time I have found you free.

Mr. CROMWELL. In order to maintain the legal entity intact and the corporate functions it is necessary that each director be in law an owner of at least one share of stock.

Senator MORGAN. Under what law is that?

Mr. CROMWELL. The New York State law.

Senator MORGAN. Yes.

Mr. CROMWELL. Accordingly, each of the thirteen directors has made an agreement with the United States Government, in writing, by which they agree to deliver that share to the United States at any time, upon the call of the United States, and have indorsed the certificate therefor and returned and delivered it to the Treasury of the United States.

Senator MORGAN. And have delivered it?

Mr. CROMWELL. Certainly; so that the United States, in its Treasury—and you may walk over there in five minutes and see them in the Treasury Department—has every single physical share of the stock. Thirteen of them, however, stand in the names of the thirteen direct-

ors, who have paid upon account a small sum, in order to make the transaction one of absolute legality, with the right and option upon the part of the United States to take back the share upon payment of the balance, the United States protecting itself, first, by the agreement of each of these directors, and, second, by the physical possession of the certificate of stock itself, indorsed by each director. That transaction qualifies each director under the law, but protects the United States in the possession of the certificates.

Senator MORGAN. So to speak. I do not believe it.

Senator TALIAFERRO. Does not the law require bona fide ownership?

Mr. CROMWELL. I think that is bona fide ownership in the sense of the law, in the sense that each director paid upon account a certain sum, giving to the United States the right to call for the share and take it by paying the balance.

Senator MORGAN. Did you prepare this arrangement?

Mr. CROMWELL. I assisted the Secretary of War in making the arrangement.

Senator MORGAN. As counsel of the Panama Railroad?

Mr. CROMWELL. As counsel of the Panama Railroad; yes, sir.

Senator MORGAN. Was it not your plan?

Mr. CROMWELL. It was a joint discussion as to how we should qualify the directors.

Senator MORGAN. You prepared the plan and then discussed it with the Secretary of War, did you not?

Mr. CROMWELL. We discussed it and I projected it. I prepared the draft paper, yes.

Senator MORGAN. You prepared the paper and discussed it with the Secretary of War, so that it was your invention?

Mr. CROMWELL. It was no invention. It is a common practice. There was nothing original about it, Senator. I do not claim any patent upon it.

Senator MORGAN. It may be a common practice, but I can say that it is the first time I have ever heard of it. You have not got the physical possession, as you call it, of that certificate of stock?

Mr. CROMWELL. Individually? Personally, you mean?

Senator MORGAN. Yes.

Mr. CROMWELL. No, sir.

Senator MORGAN. And you have indorsed it to the Government?

Mr. CROMWELL. Absolutely.

Senator MORGAN. And it is in the Treasury of the United States?

Mr. CROMWELL. Every share.

Senator MORGAN. What more, then, do you hold in regard to your office of director than a power of attorney from the United States Government to act as director in that railroad?

Mr. CROMWELL. I would not care to qualify it, sir, otherwise than as I have mentioned.

Senator MORGAN. How about Mr. Farnham's stock?

Mr. CROMWELL. The same thing.

Senator MORGAN. When did he first get any stock in this road?

Mr. CROMWELL. At the same moment—I mean, at this time; at the last annual meeting.

Senator MORGAN. He got the stock?

Mr. CROMWELL. At the last annual meeting he was qualified in the same way that I have described.

Senator MORGAN. Was he an owner of any stock before that time?

Mr. CROMWELL. No, sir.

Senator MORGAN. He got his one share under exactly the circumstances that you got yours?

Mr. CROMWELL. Absolutely. Every director did the same.

Senator MORGAN. Who issued that share to him?

Mr. CROMWELL. The Department.

Senator MORGAN. The Department?

Mr. CROMWELL. Yes, sir.

Senator MORGAN. Out of the stock owned by the United States?

Mr. CROMWELL. Yes, sir.

Senator MORGAN. What did he pay for it?

Mr. CROMWELL. The transaction was as I have described.

Senator MORGAN. Do you know the particular share of stock that Mr. Farnham holds relation to?

Mr. CROMWELL. The one share?

Senator MORGAN. Yes.

Mr. CROMWELL. The number can be furnished, certainly.

Senator MORGAN. Who owned that stock before he got the right to it?

Mr. CROMWELL. The Government of the United States.

Senator MORGAN. Who did the Government get it from?

Mr. CROMWELL. It was a part of these shares that it acquired from the canal company.

Senator MORGAN. It was a part of the shares that came over from the canal company?

Mr. CROMWELL. Yes; they qualified the thirteen directors in that way.

Senator MORGAN. The Government of the United States took a share of the stock—

Mr. CROMWELL. And qualified each one of the directors.

Senator MORGAN. Wait a minute. I am an old man, and I can not keep up with you, so I hope you will allow me to finish my question.

Mr. CROMWELL. I beg your pardon.

Senator MORGAN. The Government of the United States, then, out of the shares that it had received from the Panama Canal Company, and that had been delivered into what you call its physical possession—

Mr. CROMWELL. Yes; actual possession.

Senator MORGAN (continuing). Put one of these shares in the hands of Mr. Farnham?

Mr. CROMWELL. It did not put it in his hands at all.

Senator MORGAN. What then?

Mr. CROMWELL. In his name.

Senator MORGAN. It put it in his name?

Mr. CROMWELL. Yes.

Senator MORGAN. And gave him authority to vote it as a director?

Mr. CROMWELL. Certainly.

Senator MORGAN. By whom was he elected a director on that business?

Mr. CROMWELL. By the stockholders.

Senator MORGAN. When?

Mr. CROMWELL. At the last annual meeting, April, 1905.

Senator MORGAN. Where was that held?

Mr. CROMWELL. At New York City, the office of the company.

Senator MORGAN. What stockholders were present?

Mr. CROMWELL. All the stock.

Senator MORGAN. All the stock was represented?

Mr. CROMWELL. Every single share was represented.

Senator MORGAN. By the owner or by proxies?

Mr. CROMWELL. The owner, by proxy, being the United States Government.

Senator MORGAN. The United States Government at that time owned all these shares?

Mr. CROMWELL. I think they did.

Senator MORGAN. And its commissioners were all directors?

Mr. CROMWELL. Yes.

Senator MORGAN. Comprising seven?

Mr. CROMWELL. Seven, and qualified in precisely the same way.

Senator MORGAN. They were there?

Mr. CROMWELL. Yes, sir.

Senator MORGAN. And you were there?

Mr. CROMWELL. Yes, sir.

Senator MORGAN. What other outside stockholders were there? That made eight.

Mr. CROMWELL. If you will furnish me that list—may I trouble you once more, Senator Taliaferro, for that document?

Senator TALIAFERRO. Yes; here it is [handing Senate Document No. 127 to the witness].

Mr. CROMWELL. I think this contains the names. Would it be convenient, Senator, if I gave you the list of the entire directors at that time?

Senator MORGAN. That is exactly what I want.

Mr. CROMWELL. The board of directors elected in April, 1905, being the first election at which the United States had acquired the complete ownership, the first election after the transfer of the property to the United States, were as follows: T. P. Shonts, Charles E. Magoon, Mordecai T. Endicott, Peter C. Hains, B. M. Harrod, Oswald H. Ernst, William Nelson Cromwell, J. D. de Obaldia, William Barclay Parsons, Clarence R. Edwards, Roger L. Farnham, E. A. Drake, and John F. Wallace.

Senator MORGAN. When were they elected?

Mr. CROMWELL. April, 1905.

Senator MORGAN. On that day?

Mr. CROMWELL. Yes, sir.

Senator MORGAN. By whom were they elected?

Mr. CROMWELL. By the stock vote of the United States Government, standing in the name of the Secretary of War.

Senator MORGAN. Was that entire vote cast for all of those men?

Mr. CROMWELL. It was.

Senator MORGAN. Who nominated Mr. Farnham for one of them?

Mr. CROMWELL. The same vote.

Senator MORGAN. Oh, come! Do not let us dodge that way. I want to know what individual did it.

Mr. CROMWELL. Senator, you must change your terms to me. I have not dodged anything.

Senator MORGAN. Well, you have dodged, and have done very little else. What individual named Mr. Farnham for director?

Mr. CROMWELL. Mr. Farnham was nominated; the whole ticket was nominated by the Secretary of War.

Senator MORGAN. By the Secretary of War?

Mr. CROMWELL. Yes, sir.

Senator MORGAN. Did you nominate Mr. Farnham to the Secretary of War?

Mr. CROMWELL. I did not, nor even suggest him.

Senator MORGAN. You had nothing to do with his selection?

Mr. CROMWELL. Nothing. I was surprised, although pleased, that the Secretary of War had that confidence in him.

Senator TALIAFERRO. Was he selected because he was connected with your office?

Mr. CROMWELL. No, sir. Mr. Farnham is a very experienced man in shipping matters, and he has a very wide business experience. He really is a very superior business man, and a very honorable and high-toned man, I may say. Every man in the Government Departments here recognizes his acute and accurate information, particularly regarding transportation subjects, and it was because of that, particularly, that the Secretary of War desired him to be in that board—in giving information and acquiring information, and in being useful in that particular topic. It was of no profit to him. The directorship is a convenience and an accommodation to the Government, Senator. We receive no compensation, of course, as such.

Senator TALIAFERRO. Without meaning to imply anything against Mr. Farnham or against you, as a matter of fact who drew to the attention of the Secretary of War these qualifications of Mr. Farnham?

Mr. CROMWELL. I do not know, sir; but Mr. Farnham has been under the observation of the Secretary of War and of his Department as being a very experienced and clever man, particularly on these shipping questions, and has several times furnished, without compensation or aid, much information of value, particularly in respect of the Pacific Mail contracts and shipping lines.

Senator TALIAFERRO. He did not meet the Secretary of War through you?

Mr. CROMWELL. Yes, sir; I think he did meet him through me. Oh, yes, sir; I know he has met him a number of times, on the Isthmus and here. He has known him for a year or more, and they all have a very high opinion of his business ability. He is a very fine fellow.

Senator TALIAFERRO. As a director of the Panama Railway Company—I understood you to say you were a director?

Mr. CROMWELL. Yes, sir; at the Government instance, solely.

Senator TALIAFERRO (continuing). Are you in the habit of preparing the minutes of the meetings of the directors of that company?

Mr. CROMWELL. When I am present; yes, sir.

Senator TALIAFERRO. Were you present at the meeting held in New York on November 8, 1905?

Mr. CROMWELL. Am I recorded, sir, as being present?

Senator TALIAFERRO. I have not noticed. This is just an extract from the minutes of the meeting.

Mr. CROMWELL. I could not tell the date.

Senator TALIAFERRO. I will refresh your memory. It was the meeting that considered the Markel claim.

Mr. CROMWELL (after consulting document). I was present at a meeting of the board on November 8; yes, sir.

Senator TALIAFERRO. Did you prepare the minutes of that meeting? I understood you to say that you were in the habit of preparing them when you were present.

Mr. CROMWELL. It is a part of my duties as counsel of the company, or some one of my firm, rather, to look over the minutes, to see that they are in legal form, at meetings where I am present, and at the meeting of November 8 I performed that duty.

Senator TALIAFERRO. In looking over the minutes to see that they were in legal form, would you not have noticed if there were anything in them that had not occurred at the meeting or if there had been any occurrence of the meeting improperly set forth in the minutes?

Mr. CROMWELL. I should think so. I should try to.

Senator TALIAFERRO. The Secretary of War, under date of December 19, 1905, wrote this letter to the chairman of the Commission. [Reading:]

"MY DEAR MR. SHONTS: I have your letter of December 8, 1905, concerning the contract with Jacob E. Markel, of Omaha, and its cancellation. I beg to call your attention to one thing in the record thus shown. On page 2 of the minutes of the meeting of the board of directors of November 8 it is said:

" 'That after considering all the aspects of the case with Mr. Markel the latter had agreed to the cancellation of the contract previous to it becoming effective and without any obligation on the part of the company to reimburse him either for his services or his actual expenses, which latter amounted to \$5,745.97.'

" 'If this statement be true, then it would seem that by mutual consent the contract was dissolved, and there was no legal obligation on the part of either party toward the other growing out of it. In this condition the action of the directors in voting to Mr. Markel something over \$10,000 would seem to be the mere payment of a gratuity without any consideration of value moving to the company, and therefore I could hardly recommend to the President an approval of the payment made to the company under the circumstances stated. I beg to invite your attention to this, and to ask for such comments as you desire to make.

"Sincerely, yours,

"WM. H. TAFT."

Mr. Shonts, replying to the Secretary of War, says in the conclusion of his letter [reading]:

"The minutes of the meeting of the board of directors of the railroad dealing with this matter were subsequently prepared by the general counsel, Mr. William Nelson Cromwell, and possibly because he did not have in mind all of the facts and conditions leading up to the granting and cancellation of this concession, the minutes of the railroad, in their present form, do not fairly and accurately present the facts. A motion for their amendment in accordance with the real facts, as set forth in this communication, will therefore be moved and undoubtedly adopted at the next meeting of the board."

The date of the letter, I have stated, was December 19. Will you please explain to the committee how it was that you were present at a meeting of the board of directors, a witness to all that occurred, participating in all that occurred, and prepared the minutes of that meeting, or supervised the minutes after they had been prepared by some one

else, and that then it could be justly said of those minutes that they did not represent truly what occurred at that meeting?

Mr. CROMWELL. Senator Taliaferro, your question would be a very proper and suggestive one if it were the fact; but it seems that a misapprehension has arisen with respect to these minutes. I observe that Mr. Shonts explained it, and I shall be glad to repeat it. What you have read are not the minutes of the meeting at all. What you very properly read, and what Mr. Shonts transmitted to the Secretary of War, were not the minutes at all. They were a projet, a rough draft, by the young man who took down notes at the meeting and sent them over here to Mr. Shonts, who had supposed they had passed my eye. They had not, in fact, been seen by me, and Mr. Shonts subsequently wrote the Secretary of War so, and subsequently testified before you to the same effect.

The minutes did not reach me until long after the quotations which you have read; in the midst of very active professional work it had not reached my hand. When it did, I went over the record and noticed that it did not contain what had transpired at the meeting, particularly that it did not refer to the Wallace letter which had been called for at the meeting, and had been produced at the meeting, and in other respects; and I revised the draft to conform to the facts exactly as I knew them to be. The draft, as revised, was submitted at the ensuing board meeting, read aloud, carefully considered, and unanimously approved. The minutes upon which I passed in judgment were approved. The minutes, or form of minutes—a misnomer—that you have read, sir, were never adopted by anybody, nor passed upon by anybody but this young clerk.

Senator TALIAFERRO. You understand, Mr. Cromwell, that what I have read comes here as an extract from the minutes of the meeting.

Mr. CROMWELL. It does, sir. I do understand that, Senator.

Senator TALIAFERRO. Yes.

Mr. CROMWELL. I thank you for the courtesy with which you have put the question and the opportunity you have given me to explain it. The record here is so voluminous that perhaps you have not yourself had an opportunity to read it. If you had, you would see that Mr. Shonts subsequently explained that the reference to me in that letter was inappropriate. He had supposed that I had seen them, because they reached his office with a thousand letters in the mail, while, in fact, I had never passed upon them, nor had I seen them.

Senator TALIAFERRO. Is this young man that you speak of as having kept the rough draft of the minutes a competent man?

Mr. CROMWELL. He is quite a competent man for current work. He is a young man who sits at the table and runs in and out of the room, and as notices are made, or meetings had, makes a note of them, and he made a rough, general résumé, as a young, inexperienced man would do, and a very good project for the purpose of that occasion but it had no legal significance, no action was taken upon it, and it had no importance in that sense. It was no more than if your own private secretary had tried to make a draft of a letter for you upon your suggestions of what he ought to say and he should bring it to you, and you should find that it was not in accordance with your wishes and instructions and you had revised it and signed it. That is exactly the case I had.

Senator TALIAFERRO. It impressed me differently.

Mr. CROMWELL. I know it did.

Senator TALIAFERRO. It rather impressed me that the secretary would naturally keep an account of what actually occurred at the meeting and that what he wrote down as having occurred at the meeting had occurred there. That was the way it impressed me; just as, using your illustration, suppose I dictated a letter to my clerk.

Mr. CROMWELL. I say, suppose you dictated instructions, not a letter.

Senator TALIAFERRO. I would expect him to reproduce it.

Mr. CROMWELL. I do not mean, in using that illustration, to suppose that you dictate a letter, but that you give your clerk verbal instructions and he does not carry them in his head accurately or correctly.

Senator TALIAFERRO. A man that keeps minutes is usually present and takes down what occurs at a meeting.

Mr. CROMWELL. You observe, Senator, that the only practical revision that I found it necessary to make was not in the resolution itself. The resolution itself is of the same purport in both forms. I did not change the substance of the resolve. I merely put in those things that we knew had transpired. We knew, for instance, that the Wallace letter which had been called for had been read. We had letters of Mr. Markel, who had addressed several letters to the company upon the subject of his account and claim, and those things we had before us, and the Board requested me to prepare a voucher to carry out these ideas. It was quite a colloquy, quite a subject, and was passed upon by us with care, and was quite a current affair.

The only annoyance about it is that the young man, in his zeal to post Mr. Shonts here, not upon this particular topic, but upon the other topics—and there were 20 different topics, 20 different other subjects at that meeting besides that—to post him about the current work that we had had as a kind of memorandum, hurried off and made quickly at night this projet of the rough minutes; but they were not minutes in the sense of minutes of the law, nor minutes in the sense of voting in a legal sense. They were his projet.

Senator MORGAN. They had been recorded in the books of the company?

Mr. CROMWELL. Oh, no, sir.

Senator MORGAN. They were a mere memorandum?

Mr. CROMWELL. Merely a memorandum, not recorded, and having no significance whatever.

Senator MORGAN. How did they reach Secretary Taft, then?

Mr. CROMWELL. Because Mr. Shonts sent them to him.

Senator MORGAN. From the minutes?

Mr. CROMWELL. From this memorandum. Mr. Shonts had supposed, as he says in his letter, that I had seen it from inference.

Senator MORGAN. Then, after your attention was called to it, you went and made that correction?

Mr. CROMWELL. After he found that I had not seen them, he returned them to me, or called my attention to them, to have me look over them. He said: "Mr. Cromwell has not seen these minutes."

Senator MORGAN. It was after the attention of the Secretary of War had been called to the difficulty?

Mr. CROMWELL. Yes, sir; he saw that it was imperfect himself, and he said: "I suppose Mr. Cromwell has not known all the facts." In fact, Mr. Cromwell had not even seen it; had not seen what you have read.

Senator TALIAFERRO. I think that Mr. Shonts testified to that fact, Mr. Cromwell, later. It escaped me at the moment.

Mr. CROMWELL. Yes, he did, Senator. I had not seen what you have read. It had not passed under my eye. The minutes which I prepared are the minutes as they were presented to the board of directors at the next meeting, and the same board of directors unanimously approved the minutes in that form; and that is the only form—there never was any change of the minutes, and there never was any record of what you refer to.

Senator TALIAFERRO. The young man did not call your attention to the fact that he had sent this rough draft to Mr. Shonts?

Mr. CROMWELL. No, sir; I was unaware of it until Mr. Shonts, having made inquiries, said: "This does not seem to be right. Has Mr. Cromwell made a mistake about it?" And then I was called up and inquired whether I had been over these minutes, and I said I had never seen them. I took up the subject then in a current way.

Senator TALIAFERRO. The minutes as approved enlarged this subject?

Mr. CROMWELL. They enlarged the recital, not the resolutions, sir. The resolution is substantially the same. They recite the fact of the Wallace letter, which was brought before us at the very meeting, physically. That memorandum that you have just read does not quote the Wallace letter, which was physically called for, and which was there at the meeting, and which was a very important subject. We had quite a discussion, all the members of the Commission.

Senator TALIAFERRO. Mr. Wallace, I think, testified that Mr. Markel was entitled to compensation.

Mr. CROMWELL. Yes, sir; I have no doubt whatever that he was. I think it is a perfectly proper payment, and the Secretary of War and the President have both confirmed the payment by public order since this. I thank you, Senator, for affording me an opportunity for an explanation.

Senator MORGAN. Was that the only instance in which you took charge of and corrected the minutes of the company?

Mr. CROMWELL. I have had no occasion to do anything else other than to make the minutes conform to the facts as they passed under my eye whenever I attend meetings. In other words, it is one of the duties of general counsel of the company to see that the resolutions adopted are legal in form, so that the action of the officers does not transcend the law, and so that, if certified copies of those resolutions must be furnished to other people, they will be able to act upon them, the officers being protected upon the one side, and the other parties with whom they deal in turn being protected by their legal form. That is a common practice that the general counsel of every railroad company and every corporation in the United States performs, and ought to perform.

Senator MORGAN. But after action had been taken by the board?

Mr. CROMWELL. Oh, no.

Senator MORGAN. And recorded. Have you ever made any changes after that?

Mr. CROMWELL. Oh, never; no, sir; certainly not. There never has been any change of any description following the recorded minutes.

Senator MORGAN. The point that Senator Taliaferro wanted to examine you about came into a series of questions that I had asked you and propose to extend a little bit.

Mr. CROMWELL. Yes, sir.

Senator MORGAN. In regard to your conversation with Secretary Taft at the time that you introduced him to Mr. Farnham.

Mr. CROMWELL. But I do not recall any introduction, Senator.

Senator MORGAN. Did you and Mr. Farnham go together for the purpose of his being introduced?

Mr. CROMWELL. Oh, no, sir. I have no memory of the Secretary's first becoming acquainted with Mr. Farnham. I have no memory; nothing to connect it at all.

Senator MORGAN. Had Mr. Farnham any connection with this isthmian canal business before the time that you speak of, when you say that you presented him to the Secretary?

Mr. CROMWELL. Mr. Farnham has been an employee of my office since the year 1893.

Senator MORGAN. We understand that. You have told us that very often. I am talking about his connection with the canal company.

Mr. CROMWELL. I say, in that relation, a part of his work has been in connection with the canal matters, and part of it has been upon very many other subjects.

Senator MORGAN. Had he any connection with any of the officers of the United States Government in charge of this canal work before the time that you introduced him to the Secretary of War?

Mr. CROMWELL. By "connection," may I ask what you mean?

Senator MORGAN. I mean by "connection" any business relations in regard to the canal work before the time that you introduced him to Mr. Taft.

Mr. CROMWELL. Senator, I do not know whether I introduced him to Mr. Taft.

Senator MORGAN. I think you stated it awhile ago.

Mr. CROMWELL. Did I? I hardly think I did, sir.

Senator TALIAFERRO. I think you did. The stenographer has the minutes there.

Senator MORGAN. Yes; he stated it, too.

Mr. CROMWELL. Very likely. It is of no consequence.

Senator MORAN. Well, we will see. What was the purpose of your visit with Mr. Farnham to the Secretary of War at that time?

Mr. CROMWELL. Senator, there is no use of attempting to crowd me into the suggestion that I took Mr. Farnham to the Secretary to introduce him. I did nothing of the kind. Please refer to the minutes where you think I have indicated it.

(By request, the stenographer turned back in his notes to the point indicated by Senator Morgan and Senator Taliaferro, and read as follows:)

"Senator TALIAFERRO. He (Mr. Farnham) did not meet the secretary through you?

"Mr. CROMWELL. Yes, sir; I think he did meet him through me. Oh, yes, sir. I know he has met him a number of times on the Isthmus and here."

Mr. CROMWELL. There, Mr. Senator, you see that my recollection was right for once, and your memory was at fault. I did not say that I had introduced him.

Senator MORGAN. You said he met the secretary through you. Was not that an introduction?

Mr. CROMWELL. No, sir.

Senator MORGAN. What was it?

Mr. CROMWELL. He met him through his association with me—because of me,

Senator MORGAN. If it was because of you, it was because of something you said about him to the Secretary?

Mr. CROMWELL. Frankly, I have not the least memory of having introduced him. I may have introduced him, and it is of no consequence to me whether I did or did not; but I did not say that I had introduced him to the Secretary of War.

Senator TALIAFERRO. That is a very reasonable conclusion from what you did say?

Mr. CROMWELL. You feel it so, Senator? I did not mean it so.

Senator TALIAFERRO. I should think anybody would think so.

Mr. CROMWELL. My meaning was that he met him through my acquaintanceship, through my association, through me.

Senator MORGAN. I do not know how to get him through you. [Laughter.] If you will explain the process of it, all right.

Mr. CROMWELL. If you attach importance to it, I will pursue it further.

Senator MORGAN. I would not ask it if I did not attach some importance to it.

Mr. CROMWELL. I can say no more definitely, Senator, than that.

Senator MORGAN. It was just through you?

Mr. CROMWELL. Yes. Then, the Secretary of War became acquainted with Mr. Farnham through the fact that Mr. Farnham was in my service, possibly by introduction direct, or possibly by being sent on a message by me to the Secretary, he had become acquainted with him.

Senator MORGAN. You spoke of a certain occasion when you and Mr. Farnham together were with the Secretary of War?

Mr. CROMWELL. I have not spoken of an occasion of that kind.

Senator MORGAN. I so understood you.

Mr. CROMWELL. I have not spoken of any such occasion.

Senator MORGAN. Any occasion at all?

Mr. CROMWELL. I have not spoken of such an occasion.

Senator MORGAN. Do you remember any such occasion?

Mr. CROMWELL. When we have been together?

Senator MORGAN. Yes; with the Secretary of War.

Mr. CROMWELL. Certainly.

Senator MORGAN. What occurred during any of these colloquies in respect of his being made a director of this company?

Mr. CROMWELL. Nothing was brought under my eye, Senator. I was made aware of the fact that the Secretary intended to nominate Mr. Farnham as a director the very morning of the election. The Secretary himself brought the list to New York. He was himself present at the meeting, and himself cast the ballot, and he himself selected the board. That was the first time that I was aware that he had chosen Mr. Farnham as a director, an office of a nominal character and a nuisance at best, but a compliment.

Senator MORGAN. In what respect is the office nominal?

Mr. CROMWELL. Why, of what consequence is it to us to these nominal directors?

Senator MORGAN. What consequence about what?

Mr. CROMWELL. Of what consequence is it to be a director of the Panama Railroad?

Senator MORGAN. Well, I should think that if the directors exercised their functions in that great establishment it would be of a great deal of consequence to the Government.

Mr. CROMWELL. It is of consequence to the Government. That is another affair. I say of what personal consequence is it?

Senator MORGAN. I am not asking about personal consequence or personal things at all. I am asking about matters connected with the official conduct of this railroad corporation.

Mr. CROMWELL. Yes, sir.

Senator MORGAN. I will put it to you again, and ask you to state whether, before the time that Secretary Taft appeared in New York with Mr. Farnham on the list of directors, which you say he proposed to the board of directors—

Mr. CROMWELL. Yes, sir.

Senator MORGAN. You had in any wise recommended Mr. Farnham to him as a director?

Mr. CROMWELL. I unequivocally state that I did not, and I had no expectation of it.

Senator MORGAN. Yes. So that Mr. Farnham was the selection of Secretary Taft?

Mr. CROMWELL. Absolutely, originally, and completely.

Senator MORGAN. That is a final answer?

Mr. CROMWELL. That you may ask of him, himself, better than you can of me.

Senator MORGAN. You had been long a director in that company?

Mr. CROMWELL. Yes, sir.

Senator MORGAN. For how many years before that time, about?

Mr. CROMWELL. Oh, over ten years.

Senator MORGAN. Did you become a director at the time that you bought stock in the company?

Mr. CROMWELL. I became a director when I qualified myself by buying 31 shares, I think.

Senator MORGAN. From whom did you obtain those shares?

Mr. CROMWELL. I have forgotten, Senator. It was from somebody in the street, some casual party who wanted to sell them. Would it be of any interest to you to furnish you a statement, which I shall be glad to do, of the stock ledger of the Panama Railroad Company, showing my ownership of a few shares that I have held from time to time?

Senator MORGAN. Does that show who you got them from?

Mr. CROMWELL. I think it will. If it does not, we can furnish it, certainly.

Senator MORGAN. Does it show that you got them from the canal company?

Mr. CROMWELL. Oh, I did not get them from the canal company. I bought them myself and paid for them. They were just a few shares, to qualify myself and others as directors, Senator.

Senator MORGAN. Yes. Immediately upon your buying those shares were you elected a director?

Mr. CROMWELL. Yes, sir. I bought them for the purpose of validating my election.

Senator MORGAN. Had you been elected before that?

Mr. CROMWELL. No, sir; but I bought them for the purpose of making my coming election valid.

Senator MORGAN. You were, then, seeking the position of director?

Mr. CROMWELL. I did not say that I was seeking the position, sir.

Senator MORGAN. Well, you say that it was for the purpose of validating a coming election?

Mr. CROMWELL. That does not say that I was seeking it.

Senator MORGAN. Was anybody seeking it for you?

Mr. CROMWELL. There were people proposing it for me.

Senator MORGAN. Who were they?

Mr. CROMWELL. The canal company.

Senator MORGAN. Yes. That is what I supposed.

Mr. CROMWELL. Then you should not have supposed that I was seeking it.

Senator MORGAN. Well, I do not, now, since you say the canal company proposed it to you. Do you know of any particular reason why the canal company wanted you to be elected a director in that company?

Mr. CROMWELL. Because they thought I was efficient.

Senator MORGAN. Because they thought you were efficient? What was your salary as director?

Mr. CROMWELL. Nothing.

Senator MORGAN. What was your compensation?

Mr. CROMWELL. Nothing but the customary attendance fees.

Senator MORGAN. What were they?

Mr. CROMWELL. Oh, I think it was \$10 a meeting, or something like that.

Senator MORGAN. Something like \$10 a meeting?

Mr. CROMWELL. Yes, sir.

Senator MORGAN. Where were the meetings held?

Mr. CROMWELL. Oh, we held monthly meetings, and I was also on the executive committee, and held weekly meetings.

Senator MORGAN. Where were the monthly meetings held?

Mr. CROMWELL. Always at the office of the company, Senator.

Senator MORGAN. Where was that?

Mr. CROMWELL. In State street, New York City; 24 State street.

Senator MORGAN. The Panama Canal Company was doing its business here?

Mr. CROMWELL. Are you speaking of the canal company?

Senator MORGAN. I am talking about the canal company.

Mr. CROMWELL. Then strike all this out. I thought you were talking about the railroad company.

Senator MORGAN. I beg pardon. Do not strike it out. I will take it up on the line of the railroad company, then.

Mr. CROMWELL. But this is inappropriate, Senator, to your inquiries.

Senator MORGAN. Let it stay there.

Mr. CROMWELL. Will you allow me to strike it out?

Senator MORGAN. No, sir. I will take up the subject of the railroad, instead of asking you about the Canal Company. I will ask you about the railroad.

Mr. CROMWELL. Please note, Senator, that the foregoing answers of mine are upon the supposition—

Senator MORGAN. I will ask you—

The CHAIRMAN. I think it is fair, Senator Morgan, that a note should

be made in the record that Mr. Cromwell's answers to the questions which you have just been propounding were given under a misapprehension.

Mr. CROMWELL. I will ask the stenographer to note in the record that the foregoing answers have been given upon the assumption that I was interrogated as to the Panama Railroad Company, and Senator Morgan now states that he refers to the Panama Canal Company. I therefore withdraw my answers as relating to the Panama Canal Company. The Panama Canal Company had no office in New York.

Senator MORGAN. Who was the largest stockholder in the Panama Railroad at the time you became a director?

Mr. CROMWELL. The Panama Canal Company, the liquidator of the Panama Canal Company.

Senator MORGAN. Who represented that company in New York?

Mr. CROMWELL. The liquidator of the Panama Canal Company.

Senator MORGAN. Through whom did he represent it? By proxy or in fact?

Mr. CROMWELL. By proxy.

Senator MORGAN. Who was the proxy?

Mr. CROMWELL. The proxy was Mr. Xavier Boyard.

Senator MORGAN. Was he a standing proxy?

Mr. CROMWELL. No, sir; but practically so, because we renewed it every year to him. He was their commercial agent in New York.

Senator MORGAN. Mr. Boyard was the representative of the Panama Canal Company in New York?

Mr. CROMWELL. Yes, sir; he was the commercial agent.

Senator MORGAN. And also in the board of the railroad company?

Mr. CROMWELL. Yes, sir; we are now speaking of the old period.

Senator MORGAN. So that you got no compensation for crossing the ocean to Paris to deal with the business of the railroad?

Mr. CROMWELL. Oh, no, sir.

Senator MORGAN. All the meetings of the railroad company were held in New York?

Mr. CROMWELL. Certainly.

Senator MORGAN. The charter required that?

Mr. CROMWELL. The charter requires that the stockholders' meeting should be held in New York. The directors' meetings might be held without the State, but, in fact, no meeting of the directors was ever held without the State.

Senator MORGAN. At the same time that you were made a director were you employed as the general counsel of the railroad company?

Mr. CROMWELL. Yes, sir; of the railroad company.

Senator MORGAN. At what salary?

Mr. CROMWELL. I think it originally was \$5,000, and then subsequently it was increased to \$6,000, or so.

Senator MORGAN. Six thousand dollars, or so?

Mr. CROMWELL. I will give you a list of that, if you want it.

Senator MORGAN. I want it.

Mr. CROMWELL. I will gladly give it to you if the stenographer will make a note of it for me.

Senator MORGAN. I want it now.

Mr. CROMWELL. All right. I will take you to New York to get it.

Senator MORGAN. You have not got it in your mind?

Mr. CROMWELL. Why, of course not.

Senator MORGAN. It is not a matter of course to me that a man can not keep thousands of dollars in mind.

Mr. CROMWELL. With great respect, it is so with me, Senator.

Senator MORGAN. It seems to be that way with you. I am sorry it is not so with me. I want to know about what your salary was in the beginning, and then I want to know the increases that were made in your salary?

Mr. CROMWELL. You shall have it. I have furnished it to the House committee, who went over this ground for six weeks last summer. I gave the committee all the information, and it is already a matter of public record, but I shall be very glad to repeat it for your benefit.

Senator MORGAN. I have never seen that record.

Mr. CROMWELL. That is not my fault.

Senator MORGAN. Up to what figure was your salary increased?

Mr. CROMWELL. Up to \$6,000 or \$6,500. I have forgotten. It did not exceed \$6,500.

Senator MORGAN. You continued at that figure?

Mr. CROMWELL. Yes, sir. Mr. Curtis, is it \$6,000 or \$6,500?

Mr. CURTIS. Six thousand dollars.

Mr. CROMWELL. Six thousand dollars.

Senator MORGAN. It has continued at that figure up to date?

Mr. CROMWELL. Unchanged; yes, sir. That salary was to my firm, Sullivan & Cromwell. Most of the work is done by my partner.

Senator MORGAN. I do not care about that.

In buying your stock and having yourself elected as director—or, I had better say, perhaps, being elected director—did you have any reference to this salary for representing the company as general counsel?

Mr. CROMWELL. Oh, no, sir; I just accepted the duties of director because I was requested by the canal company to act as such. That was all.

Senator MORGAN. Was there not a specific object in employing you as a director, and also as general counsel of the company, outside of the ordinary business of carrying on the operations of a railroad company?

Mr. CROMWELL. Oh, not at all.

Senator MORGAN. Who was your predecessor as general counsel of the company in the United States?

Mr. CROMWELL. I think the Messrs. Coudert Brothers were counsel preceding us. It was back in 1893 that I became attorney for the Panama Railroad Company.

Senator MORGAN. In 1893?

Mr. CROMWELL. In 1893 I was counsel.

Senator MORGAN. Who was your predecessor?

Mr. CROMWELL. The Messrs. Coudert Brothers.

Senator MORGAN. Did they hold until you occupied the position?

Mr. CROMWELL. Yes, sir.

Senator MORGAN. Were they elected as general counsel by the railroad company?

Mr. CROMWELL. Yes, sir. They had been before, and I succeeded them; our firm succeeded them.

Senator MORGAN. For how many years?

Mr. CROMWELL. They had been counsel for several years.

Senator MORGAN. They were competent men, were they not?

Mr. CROMWELL. Oh, very fine, competent men.

Senator MORGAN. Was there any particular reason why any change had to be made or was wanted to be made in the general counsel of that company at that time?

Mr. CROMWELL. I do not know what operated upon the minds of my clients.

Senator MORGAN. Did you have any particular purpose to accomplish in going into that arrangement?

Mr. CROMWELL. Not at all. The retainer was absolutely unsolicited and unpremeditated.

Senator MORGAN. Had you before that time been chosen as counsel of the Panama Canal Company in the United States?

Mr. CROMWELL. I had not, and did not know the Panama Canal Company.

Senator MORGAN. You did not know anything about them?

Mr. CROMWELL. Nothing; not until three years later, when I became counsel for the canal company.

Senator MORGAN. How long was it after you were made counsel for the railroad company before you were elected as counsel for the Panama Canal Company?

Mr. CROMWELL. About three years.

Senator MORGAN. That would be in 1896?

Mr. CROMWELL. About 1896; yes, sir. Maybe it was four years. It was three or four years. I can get all those dates for you, if you think they are important.

Senator MORGAN. What particular event or circumstance made it necessary at that time for the Panama Canal Company to have counsel in the United States?

Mr. CROMWELL. I do not recall.

Senator MORGAN. Had they ever had any before?

Mr. CROMWELL. I do not know.

Senator MORGAN. You do not know?

Mr. CROMWELL. No, sir.

Senator MORGAN. If there had been such counsel of the Panama Canal Company in the United States, would you not have known it?

Mr. CROMWELL. No; because I had no relations to the canal company, and would not be charged with any duty in that regard.

Senator MORGAN. With all your knowledge of affairs of the Panama Canal Company, you have never made an inquiry as to whether they had previously had American counsel?

Mr. CROMWELL. I never had taken any interest in that question. I had enough to do when I became counsel.

Senator MORGAN. What was the first work that you did in America for the Panama Canal Company?

Mr. CROMWELL. I must beg to be excused, Senator, from the pursuit of that subject, as that is a professional confidence.

Senator MORGAN. Is the fact that you had law suits, or gave advice, or anything of that sort, a professional secret?

Mr. CROMWELL. In respect of the business of the Panama Canal Company, our relations are professional and confidential and I must beg to be excused from relating their business.

Senator MORGAN. What was the first work that you did for the Panama Canal Company in America?

Mr. CROMWELL. I do not recall, sir.

Senator MORGAN. What was the principal work that you first did for the Panama Canal Company in America?

Mr. CROMWELL. I do not recall what I did at any time in their affairs, and if I did I should not feel at liberty to state their business.

Senator MORGAN. You conducted much business for them in America, did you not?

Mr. CROMWELL. I beg to be excused from going into that.

Senator MORGAN. Did you conduct any business for them in America?

Mr. CROMWELL. I beg to be excused from a reply to that.

Senator MORGAN. What was your salary as general counsel of that company?

Mr. CROMWELL. I beg to be excused from reply.

Senator MORGAN. You do not propose to tell anything about what you did or what you received from that company?

Mr. CROMWELL. I do not consider myself at liberty to discuss the professional relations of a client.

Senator MORGAN. You have mentioned already that you received \$200,000 from them, and that it was in installments, not annually exactly, but as you called for them. You have mentioned that fact. Was that a professional confidence?

Mr. CROMWELL. I have mentioned it, sir, out of good nature, perhaps.

Senator MORGAN. Was that in payment for work that you did in the United States?

Mr. CROMWELL. I beg to be excused from replying. My service was general and broad, and covered trips to Europe and——

Senator MORGAN. Were they paying you for your personal influence upon the United States or the people of the United States and the Congress of the United States, or were they paying you for professional services?

Mr. CROMWELL. For professional services.

Senator MORGAN. Exclusively?

Mr. CROMWELL. Yes, sir.

Senator MORGAN. And although you stated that you received \$200,000 from them, you decline to state any business that you did for them at all?

Mr. CROMWELL. I do.

Senator MORGAN. And you cover that under a professional confidence?

Mr. CROMWELL. I do; and also because I think this committee has no power to go into such subjects; but that I do not pass upon.

Senator MORGAN. I am not proposing to judge for the committee, nor do I think that you have the privilege of doing that. We will have to have that tested somewhere else, provided it is considered to be worth while. I do not think it is worth while.

Mr. CROMWELL. I am perfectly willing to test it anywhere you want to.

Senator MORGAN. Yes; I know you would like to, but I do not know that we want you to.

Now, Mr. Cromwell, you have many other clients?

Mr. CROMWELL. I have.

Senator MORGAN. And you have mentioned the clientage of the Panama Government and the Panama Railroad Company; why is there

any more professional confidence connected with your relations to the Panama Canal Company than there is with the railroad company or the Government of Panama or your commissionership as commissioner of finance to the Panama Government?

Mr. CROMWELL. Because as counsel for the Panama Railroad Company I have a duty to this Government, through my relations as attorney for the Panama Railroad Company. In respect of what I have stated to you and the committee regarding the financial status, investments, etc., of the Panama Government, I have consulted that Government before making these statements, and have received their written permission to make them. That is the only reason I give them to you.

Senator MORGAN. Have you consulted the Panama Canal Company as to making these statements?

Mr. CROMWELL. I have not.

Senator MORGAN. Why not?

Mr. CROMWELL. It is too palpably an impropriety, because it relates to an entirely different class of business.

Senator MORGAN. To what class of subjects does this business relate that you are employed by the Panama Canal Company to transact?

Mr. CROMWELL. Professional service of all kinds.

Senator MORGAN. Bringing lawsuits?

Mr. CROMWELL. The relations to the Panama Government that I refer to are physical matters, which are matters of public record.

Senator MORGAN. Be kind enough to answer my question, instead of going on with your disquisitions, and I shall be obliged to you. I am not able to stay here forever to talk with you. Was your business professional or in the way of bringing lawsuits for the Panama Canal Company in the United States?

Mr. CROMWELL. I beg to be excused, sir, from any description of the service which I performed or my firm performed for the new Panama Canal Company.

Senator MORGAN. Or as to defending lawsuits?

Mr. CROMWELL. I think I have answered the question, sir. I do not mean to be at all rude in my reply, Senator.

Senator MORGAN. No; we do not want to have any rudeness about it.

Mr. CROMWELL. My position is—

Senator MORGAN. Was your business in anywise connected with the lobbying of measures of the Panama Railroad Company through Congress?

Mr. CROMWELL. No, sir.

Senator MORGAN. Or advocating them before committees of Congress?

Mr. CROMWELL. I have appeared before committees of Congress.

Senator MORGAN. At the instance of that company?

Mr. CROMWELL. Yes, sir; as counsel for the company.

Senator MORGAN. That is one thing that we have got, anyway. Were you paid for that? Have you been, to any extent, and what?

Mr. CROMWELL. I can not differentiate, Senator, and I must decline to go further into that subject. I have rendered no bill for individual services.

Senator MORGAN. I did not suppose that you had rendered any bill, and I did not ask you if you had. I asked whether or not you had been paid for the service in whole or in part?

Mr. CROMWELL. I decline to proceed further into the discussion of that topic.

Senator MORGAN. Well, you have addressed letters to the President of the United States, which you have signed as counsel in chief, or counsel for the Panama Canal Company?

Mr. CROMWELL. I have.

Senator MORGAN. You have been paid for that service?

Mr. CROMWELL. I have received, as I have already told you, certain compensation on account of all the services I have rendered. It is impossible for me to differentiate and say how much I have received for each particular piece of work.

Senator MORGAN. Have you ever rendered a bill for your service?

Mr. CROMWELL. No, sir.

Senator MORGAN. You also represented the Panama Canal Company as its chief counsel, in a letter that you wrote, which was sent by the President to the Senate, recommending the ratification of the Hay-Herran treaty?

Mr. CROMWELL. Yes, sir.

Senator MORGAN. You were paid for that service?

Mr. CROMWELL. I performed that service, and, as I have already described, I have received payments upon account of my general services. I have not specified that as an individual one, nor received special compensation for it.

Senator MORGAN. Did you render that service as counsel for that company?

Mr. CROMWELL. Yes, sir.

Senator MORGAN. And published it to the world in your official note?

Mr. CROMWELL. Certainly.

Senator MORGAN. That being so, what reason is there, if you can assign any, for your refusal to answer any questions in regard to your professional connection with the Panama Canal Company in the business that you prosecuted for it in the United States?

Mr. CROMWELL. Because I think it is a violation of professional confidence to do so. So much of the record wherein I have appeared for the New Panama Canal Company as its general counsel as is a matter of public record you are ready to read, and it is at your command.

Senator MORGAN. While you were advocating the claims of the Panama Canal Company to the President and to the Secretary of State and to the chairman of the Committee on Interstate and Foreign Commerce in the House, you subscribed your name as chief counsel, and all that?

Mr. CROMWELL. Yes, sir.

Senator MORGAN. You made all those representations in that way. Why did you feel free to disclose your professional relations at that time and not now?

Mr. CROMWELL. Why, I disclose now as much as then, namely, that I was their general counsel, and proceeded to make the arguments which I did then make.

Senator MORGAN. What arguments or propositions or offers did you make as the counsel of the Panama Canal Company to other persons besides those you addressed to the President of the United States, to the Secretary of State, and to the chairman of the Committee on Interstate and Foreign Commerce of the House?

Mr. CROMWELL. I decline to answer, on the ground that it is a professional confidence.

Senator MORGAN. Do you decline to answer in explanation of what you have stated in those written communications?

Mr. CROMWELL. I do.

Senator MORGAN. You do?

Mr. CROMWELL. Yes, sir.

Senator MORGAN. You will give no explanation of them?

Mr. CROMWELL. I will not.

Senator MORGAN. I will try you on one or two of them after a while. Your attitude about this matter strikes me as being so unusual that I feel inclined to try to get to the bottom of it, and to understand it if I can.

Mr. CROMWELL. There is nothing unusual about it, sir.

Senator MORGAN. Not with you, I suppose.

Mr. CROMWELL. Every lawyer should do the same, and ought to do the same, and I am sure that you would do the same if you were practicing.

Senator MORGAN. I am asking as a lawyer, now, in regard to your professional confidences: You think that a lawyer has a right to come out and write a letter making propositions and making statements and addressing them to the President of the United States, or the Secretary of State, or the chairman of the Committee on Interstate and Foreign Commerce of the House, and then to refuse to explain any statement he made in that letter?

Mr. CROMWELL. I do. It is ancient history and not of the remotest consequence to anybody.

Senator MORGAN. You seem disposed to treat the subject with contempt. I do not understand that. You had a contract with the Panama Canal Company which bears date November 21, 1899. Do you recall that contract?

Mr. CROMWELL. What contract?

Senator MORGAN. The contract made with the canal company on November 21, 1899.

Mr. CROMWELL. I do not recall any contract, Senator.

Senator MORGAN. Do you recall any power of attorney or authorization that they gave to you of that date?

Mr. CROMWELL. I do not recall it by its date, no, sir. There may have been some instrument that passed at that time, but the date does not identify it to me.

Senator MORGAN. I will read the first part of it to you to see whether you recall it. [Reading:]

"Mr. William Nelson Cromwell is exclusively empowered under the formal agreement with the board of directors of the Compagnie Nouvelis du Canal de Panama (New Panama Canal Company of France) to effect, with an American syndicate, the Americanization of the Panama Canal Company under the following basis."

Do you recall that?

Mr. CROMWELL. I recall that there was a proposal of that kind.

Senator MORGAN. That was not made with you as general counsel, was it?

Mr. CROMWELL. Yes, sir.

Senator MORGAN. Is that a professional secret?

Mr. CROMWELL. Yes, sir.

Senator MORGAN. Unfortunately I shall have to reveal it for you. I will read it. [Reading:]

Americanization of the Panama Canal.

THE PANAMA CANAL COMPANY OF AMERICA.

Mr. William Nelson Cromwell is exclusively empowered under the formal agreement with the board of directors of the Compagnie Nouvelis du Canal de Panama (New Panama Canal Company, of France) to effect with an American syndicate the Americanization of the Panama Canal Company under the following basis:

1. *American Company.*—A new corporation shall be organized under the laws of the State of New York, or New Jersey, or Delaware, under the name of "The Panama Canal Company of America" (or other title), which company shall have for its principal object the completion, maintenance, and operation of the Panama Canal, and any other object that may tend to the realization of that purpose, as well as such other objects that may be set forth in the articles of incorporation.

The articles of incorporation shall prescribe that at least three-fourths in number of the entire board of directors shall be citizens of the United States, and that the principal office of the company shall be located in the United States.

II. *Capitalization.*—Preferred stock 600,000 shares of \$100 each \$60,000,000.

(a) Entitled to preference over the common stock in dividends which may be declared in any year to the extent of 5 per cent; and also entitled to participate pro rata with the common stock in all dividends which may be declared in any year in excess of 5 per cent upon the preferred stock and 5 per cent upon the common stock.

(b) Entitled to preference over the common stock, to the extent of the par value thereof, upon liquidation of the company.

Common stock, 450,000 shares of \$100 each, \$45,000,000.

The common stock subject to the aforesaid preferences in respect of the preferred stock, is entitled to the dividends which may be declared in any year to the extent of 5 per cent; and also is entitled to participate pro rata with the preferred stock in all dividends which may be declared in any year in excess of 5 per cent upon the preferred stock and 5 per cent upon the stock.

III. *Both classes of stock shall have like voting powers.*—The American company in consideration of \$100,000,000 (of which \$55,000,000 shall be paid in such preferred stock and \$45,000,000 in such common stock), will purchase and acquire from Mr. Cromwell, or his nominees:

(a) The Panama Canal and concessions (and all existing deposits under such concessions), including all the canal works, plant, machinery, buildings, and all other real and personal fixed and movable property upon the Isthmus of Panama belonging to the Compagnie Nouvelle du Canal de Panama (the French company), or in which the latter may be interested; all plans, surveys, reports, data, and records pertaining to the canal; also all lands ceded gratuitously by the Colombian Government under paragraphs 7 and 8 of article 1 of the concessions necessary for the requirement of the construction and operation of the

canal. (The subsidy lands granted by Article IV of the concessions and not upon the line of the canal are exempted from this transaction.)

(b) The American company will also acquire the rights of every nature belonging to the French company in the 68,534 shares of stock (out of the total issue of 70,000) of the Panama Railroad Company, a corporation created in 1849 under special act of the legislature of the State of New York.

These railroad shares are to become the absolute property of the American company, upon the completion of the canal, without any further payment whatever. In the meantime they will continue to be held in trust (as at present is the case in respect of the French company) to abide the fulfillment of said condition.

(c) The American company also shall receive \$5,000,000 in cash as a part of this transaction.

(d) The American company also will have \$5,000,000 preferred stock remaining in its hands for future sale.

IV. *Absolute title to property and freedom from mortgage sale.*—The title of the American company to the property and concessions so to be acquired shall be absolute (subject to said provisions as to said Panama Railroad Company stock); and such property and concessions shall be free and clear of any mortgage or other lien.

All money payments and deposits (amounting to many millions of francs) required by the concessions to be made to the Republic of Colombia have been made to date and the concessions are in full force. A large portion of the canal works is already constructed and it is not doubted that the period (October, 1904) fixed by the concessions for the entire completion of the canal will be extended by Colombia in due course (as on each previous occasion) for such further period as may be found necessary, and that Colombia will thus continue to further the undertaking which is of such vast concern to its national and commercial welfare.

V. *Provision for completion of canal by bond issue.*—The board of directors shall be empowered to create, issue, and sell bonds, secured by mortgage or mortgages upon all the canal property, concessions, etc., of the American company, acquired and to be acquired; and also to determine the amount of such bond issues, the rate of interest upon such bonds, and the conditions and price of issue. To comply with the requirements of the charter of the French company, there shall be accorded to the shareholders and bondholders of the "Universal Inter-oceanic Canal Company, in Liquidation" (the original French company), a right of preference to subscribe for one-half in amount of such bonds.

VI. *Twenty-two million five hundred thousand dollars common-stock trust.*—Agreeably to the requirements of the syndicate, a trust shall be established by Mr. Cromwell or his nominees, in respect of \$22,500,000 par value of the shares of the common stock acquired by him or them, or in respect of trust certificates for such shares. The shares or trust certificates (and all dividends thereon) embraced in said trust (a) may be disposed of by the trustees for the best interests of the said certificate holders or shareholders and of the other stockholders of the American company, at such time and in such manner, under such conditions, and to such ends as they may deem advisable; and (b) upon the termination of the trust the shares or trust certificates and moneys then in hand shall be distributed for the best interests of such

certificate holders or shareholders and the other stockholders of the American company, at such time, in such manner, under such conditions, and to such ends as the trustees may deem advisable; and in the meantime such share or trust certificates may, by the trustees, be voted for the election of such board of directors of the American company and for such acts and measures as they may deem to the best interests of the syndicate and of the stockholders of the American company.

The trustees shall be five in number; a majority shall be citizens of the United States; of said trustees, two citizens of the United States shall be designated in the first instance by the advisory committee, and the vacancies in respect of two such memberships shall be filled by the holders (acting by and through a majority in interest) of the shares of the trust certificates purchased by the syndicate.

This trust shall continue until ten years after the opening of the canal to commerce, unless sooner terminated pursuant to the terms of the contract or trust covering the subject.

VII. Guaranty to American syndicate of full minority representation in directory of American company.—Agreeably to the requirements of the syndicate, provision shall be made whereby the holders of the shares or trust certificates purchased by the syndicate shall be entitled to designate and cause to be elected the full minority (to wit, one less than a majority) of the members composing the board of directors of the American company, until ten years after the opening of the canal to commerce, unless such right be sooner terminated pursuant to the terms of the contract or trust covering the subject. Such minority shall, in the first instance, be designated by the advisory committee, and thereafter by such holders of shares or trust certificates, acting by and through a majority in interest of such holders; and all nominees of such holders or advisory board committee shall be citizens of the United States.

VIII. Execution of plan.—It is understood that the articles of incorporation, by-laws, trust deeds, contracts, and other instruments requisite for the accomplishment of the plan are necessarily subject to the approval of the French company, upon the acceptance by it of stock in payment from Mr. Cromwell, or his nominees; and it is also recognized that the unique character of the enterprise, the international interests involved, and the special circumstance of the case, require that plenary and discretion and power be possessed by Mr. Cromwell to effect the Americanization of the canal.

It is therefore understood and agreed that Mr. Cromwell may proceed to negotiate, determine, and agree upon all plans, terms, agreements, conditions, questions, and details which he may deem necessary and advisable in respect of the purposes herein generally indicated, including the terms and provisions of all trusts and agreements which he may deem advisable to have established or made; the articles of incorporation and by-laws of the American company, which may include adequate provisions for the redemption and retirement of the capital stock, any merger, consolidation, reincorporation, dissolution, or other disposition, arrangement or rearrangement of all or any of the property capitalization and concerns of the company upon any consideration approved by the board of directors and the holders of the specified proportion (not less than two-thirds) of the capital stock of the company outstanding at the time being, all titles, property, and

transfers, all stock issues and trust certificate issues, and every other subject or matter which he may consider to be involved in the execution of the plan, and his action in any such regard shall be and become part hereof as if herein set forth; and, further, that he and any member of the advisory committee and counsel, like others, may become a subscriber to the syndicate agreement and be eligible to any trusteeship or directorate, and may occupy any official or personal relation to said enterprise without accountability for any benefit derived therefrom.

All the terms and provisions of this plan may be carried out by contracts, trusts, or other legal method, and certificates for shares of such stock or negotiable certificates of trust or other evidence of interest (daily registered with a trust company in the city of New York) shall be issued and delivered by the syndicate subscribers.

IX. Advisory committee and counsel.—Messrs. ———, ——— are constituted an advisory committee of the syndicate subscribers with the professional assistance of Messrs. Sullivan & Cromwell and Mr. ———, as counsel, to possess and exercise the powers specified in Division VI and VII hereof and to advise with Mr. Cromwell in the execution of the plan. The reasonable charges and expenses of said committee shall be discharged by the trustees of the stock trust to be created under Division VI hereof.

Dated November 21, 1899.

Americanization of the Panama Canal.

SYNDICATE SUBSCRIPTION AGREEMENT, \$5,000,000.

Referring to the foregoing plan, we, the undersigned, each for himself and not for the other, in consideration of \$1 to each of us in hand paid by William Nelson Cromwell, the receipt whereof is hereby acknowledged, and of our mutual subscriptions, do hereby severally subscribe for, and do agree with said William Nelson Cromwell to purchase and from him to take—

One hundred dollars par value of the preferred capital stock, or, at his option, negotiable preferred-stock trust certificates for all or any part thereof; and two hundred dollars par value of the common capital stock, or, at his option, negotiable common-stock trust certificates for all or any part thereof, issued in respect of capital stock of the American corporation to be created under the foregoing plan.

For each \$100 in money, to the amount set opposite our respective names, and to pay for the same upon the call of the said William Nelson Cromwell, provided such call be not made prior to February 1, 1900, and fifteen days' notice be given of such call.

Payments shall be made to ——— Trust Company, in the city of New York, and shall by it be paid over to the American company upon the order of Mr. Cromwell against the receipt of such trust company from him, for account of the subscribers of the stock or trust certificates purchased by them hereunder.

It is understood and agreed that this agreement shall not be binding unless subscriptions be made and allotted to the full amount of \$5,000,000; and that owing to the special circumstances of the case, and in the interests of all, Mr. Cromwell shall have the right and power to reject or to reduce any subscription hereunder at any time before

final allotment by him; and also that he may deliver certificates for the shares of such stock or trust certificates to any extent within the respective classes of preferred and common stock or trust certificates that he may find desirable.

This agreement shall bind, and is for the benefit of the parties hereto and their respective executors, administrators, survivors, and assigns, and may be executed in several parts or copies with the same force and effect as if all the subscription agreements were to be one part or one copy thereof.

Dated November 21, 1899.

Senator KITTREDGE. Senator, in what way is that subject material to the inquiry that we are making?

Senator MORGAN. Do you prefer to enter into a discussion of that in an open session?

Senator KITTREDGE. I would like to have your notion about that. The resolution of the Senate is very clear about what we are to investigate. As I read the resolution it does not authorize us to enter into an inquiry regarding the affairs of the New Panama Canal Company.

Senator MORGAN. I wish to ask Mr. Cromwell another question before I respond.

Senator KITTREDGE. Certainly.

Senator MORGAN. Did you prepare that paper?

Mr. CROMWELL. I decline to answer.

Senator MORGAN. On what ground?

Mr. CROMWELL. On the ground that it is a professional communication.

Senator MORGAN. This paper, on its face, is not a contract with the attorneys of the New Panama Canal Company, but a contract with William Nelson Cromwell. Is there any professional relation involved in the fact of your making a contract with the New Panama Canal Company.

Mr. CROMWELL. It is not a contract. It is a power of attorney to me, as general counsel of the company, written in my name, to accomplish broad plans which the board of directors considered. It never matured into anything. It never was consummated, either by subscription or by assent, and it is obsolete and an impracticable thing—proved so to be. It has no life or force of being, did not exist, and never has existed, and is as dead as a doornail.

Senator MORGAN. This is not an agreement with your firm, Sullivan & Cromwell. It was Sullivan & Cromwell, so your testimony shows, who were the counsel of this Panama Canal Company, and this is with William Nelson Cromwell.

Mr. CROMWELL. My engagement is personal to myself, sir. My appointment is individual—William Nelson Cromwell. Of course my services includes those of my firm as well; but my appointment is an individual appointment.

Senator MORGAN. What appointment?

Mr. CROMWELL. As general counsel of the New Panama Canal Company.

Senator MORGAN. If that is so, why, in addressing the President, and in addressing the Secretary of State, and in addressing the chairman of the Committee on Interstate and Foreign Commerce, have you always signed "Sullivan & Cromwell, counsel in chief for the Panama Canal Company?"

Mr. CROMWELL. I have signed both ways, Senator, as you will observe. Sometimes I have signed our firm name and sometimes I have signed individually.

Senator MORGAN. I am speaking of those occasions in which you signed the firm name.

Mr. CROMWELL. It all comes to the same thing, as a matter of professional duty, because whatever I do myself includes my firm, and whatever my firm does includes myself. There is an absence of professional distinction.

Senator MORGAN. I will read this first paragraph again:

"Mr. William Nelson Cromwell is exclusively empowered under the formal agreement with the board of directors of the *Compagnie Nouvelis du Canal de Panama* (New Panama Canal Company, of France), to effect, with an American syndicate, the Americanization of the Panama Canal Company, under the following basis."

Mr. CROMWELL. That was a fruitless suggestion of the company, which came to naught, and under which I acted as their counsel solely. For that reason I decline to enter into a discussion of it any more than I would into any other affair of theirs.

Senator MORGAN. You put it upon the ground that it was a professional arrangement with that company?

Mr. CROMWELL. Yes, sir.

Senator MORGAN. Well, if so, why do you stipulate in this proposition that William Nelson Cromwell shall receive the fees that were coming in consequence of any legal services?

Mr. CROMWELL. It does not say so.

Senator MORGAN. Well, what does it say, then? I will see.

The CHAIRMAN. Is that paper signed? I did not hear any signatures read. Are there any signatures attached to that paper?

Senator MORGAN. No, sir; there are no signatures to it, and none needed, when a party swears that he executed such a contract.

Mr. CROMWELL. It is not a contract; it is an abortive project.

Senator MORGAN. About the abortion, we will come to those things, several of them, later.

Senator DRYDEN. Is there anything in connection with that paper that gives it any life or vitality, or has it ever had any life or vitality?

Senator MORGAN. I think I will establish that it has life and vitality, and that he got a corporation of New Jersey to carry it into effect, and that it has been printed and is in the hands of the Senate.

Mr. CROMWELL. Nothing was ever done under it.

Senator KITTREDGE. Senator Morgan, have you asked the one question that you desired to ask before answering the question that I suggested.

Senator MORGAN. I had read that to him, and he had made a statement in regard to it.

Have you a copy of the "agreement with the board of directors of the New Panama Canal Company to effect with an American syndicate the Americanization of the Panama Canal Company upon the following basis?"

Have you a copy of that agreement?

Mr. CROMWELL. I beg to be excused from pursuing that subject, because it involves confidential and professional relations. I do not wish to be impolite, and I do not wish to be constantly making the

statement that may seem a little harsh; but I say, once and for all, that all these matters are confidential.

Senator MORGAN. You are at perfect liberty to make any statement that you want to about me or to me. You need not be afraid that you will hurt my feelings or that you need consult them in this matter.

Mr. CROMWELL. I would not. In the first place, I have too much respect for you, and in the second place there is no reason for it. I simply say that I want you to understand that I am not, in my declarations, at all meaning to be harsh in any reply that I make, but that once and for all, we might as well understand it, that I regard all my relations to the Panama Canal Company as confidential, and that it would be improper for me to discuss their affairs in any relation. Any lawyer in the land would say so.

Senator MORGAN. All your relations?

Mr. CROMWELL. I have stated to the committee, I think, and I have tried at least with extreme frankness—even to the very verge, perhaps beyond the verge, of professional duty in that regard—to assist you, to enlighten you, upon anything that would help the committee, but all the resurrection of the past which these topics allude to serves no purpose.

Senator MORGAN. This paper has been read to you, in your hearing, and is subject to your inspection here in this committee room. Can you point out any feature in it or any statement in it that has any reference to your employment as counsel?

Mr. CROMWELL. I state the fact, that whatever significance it had at the time—although now a dead affair—whatever significance it had at the time, it was to me in my relation as counsel of the Panama Canal Company.

Senator MORGAN. You, then, feel that you have been at liberty, and are still at liberty, to conduct transactions in which the United States and the people of the United States are concerned, and in which individuals are concerned, in your own name, and under special power of attorney, with the canal company, and that you are under no obligation to state those facts transacted with you individually, because you and Sullivan are the counsel of the Panama Canal Company. Is that your attitude?

Mr. CROMWELL. I have explained my attitude in my own language better than you have tried to explain it for me.

Senator MORGAN. What is your answer to that question? Is that your attitude?

Mr. CROMWELL. I have already explained my attitude so fully that—

Senator MORGAN. You decline to answer the question?

Mr. CROMWELL (continuing). That I decline to make further explanation.

Senator MORGAN. Do you decline to answer the question that I have asked you, as to whether the statement I have made there is your attitude toward this country and that company?

(By request the stenographer read the question referred to by Senator Morgan, as follows.)

“Senator MORGAN. You then feel that you have been at liberty, and are still at liberty, to conduct transactions in which the United States and the people of the United States are concerned, and in which individuals are concerned, in your own name, and under special power

of attorney, with the canal company, and that you are under no obligation to state those facts transacted with you individually because you and Sullivan are the counsel of the Panama Canal Company? Is that your attitude?"

Mr. CROMWELL. My attitude is that whenever I have transacted any business with the States—

Senator MORGAN. Wait a minute. I asked you—

Senator KITTREDGE. I insist that the witness shall have the privilege of answering.

Senator MORGAN. Is that your attitude?

Senator KITTREDGE. I insist that the witness have the privilege of answering the question.

Senator MORGAN. He shall have the privilege of answering.

Mr. CROMWELL. That is not my attitude.

Senator MORGAN. Very good. Now, go ahead.

Mr. CROMWELL. My attitude is that whenever I have had any business to transact for the New Panama Canal Company with the Government of the United States or any committee I have been ready to explain and produce my authority for the particular transaction. As to all other business of internal administration, counsel, advice, and the like, that is confidential to my client, and I will not speak of it.

Senator MORGAN. That is your final answer?

Mr. CROMWELL. It is.

Senator MORGAN. Did you obtain an act of incorporation in New York or New Jersey for the purpose of carrying this agreement into effect?

Mr. CROMWELL. I decline to answer, for the same reason.

Senator MORGAN. The records of New Jersey show—and I will ask the privilege of bringing in the corporation act to show that you did incorporate it for that purpose, and Mr. Lemarquis, who was chief counsel of the canal company in France, has sworn that the obtaining of that act of incorporation was a part of this same agreement before this committee. Did you obtain such an act of incorporation?

Mr. CROMWELL. I decline to answer, for the same reason.

Senator MORGAN. There is an act of incorporation, as soon as I can possibly lay my hands upon it, in the archives of the Senate or at the document room of the Senate, which describes a transaction corresponding with this. Did you procure that act of incorporation?

Mr. CROMWELL. I decline to answer, for the same reason.

Senator MORGAN. Your name is mentioned in it as one of the incorporators. Was that done without your authority?

Mr. CROMWELL. Whatever was done was done.

Senator MORGAN. Was it done with your authority or without it?

Mr. CROMWELL. Whatever I did, I did?

Senator MORGAN. Was it done with your authority or without your authority?

Mr. CROMWELL. Whatever I did, I did.

Senator MORGAN. What did you do, and what was did? [Laughter.]

The CHAIRMAN. I understand that you are going to produce the record, Senator, and if you are, the record will show, will it not? Will not that answer your question?

Senator MORGAN. Mr. Chairman, I have a right to ask this question and to have it answered. If I have not, or if you overrule me, I will take it to the Senate, and ask the Senate to decide upon it.

The CHAIRMAN. There is no disposition to overrule you, Senator. The understanding I had was that you were going to have the record produced and that the record would show what you were asking for.

Senator MORGAN. I think I know my rights, and I think I am——

The CHAIRMAN. You certainly do, Senator.

Senator MORGAN. And I am certain not to abandon them.

(By request, the stenographer read the last question, as follows:)

“Senator MORGAN. What did you do, and what was did?”

Mr. CROMWELL (addressing the stenographer). What was done, he meant.

Senator MORGAN. Leave it just as I have put it. I do not propose to have you ask for me. [Laughter.]

Mr. CROMWELL. Very well, Senator. I thought it was a slip of the tongue, sir. [Laughter.] Are you waiting for me, Senator?

Senator MORGAN. Yes.

Mr. CROMWELL. I decline to answer, other than as I have already.

Senator MORGAN. Mr. Chairman, I want to see this matter in print before I go further with it. I have been suffering excruciating pain from the rheumatism to-day and yesterday, and I will ask an adjournment of the committee until to-morrow morning and that the record be printed.

Senator TALIAFERRO. I move that the committee adjourn until to-morrow at 10.30 o'clock a. m.

(The motion was carried, and the committee thereupon, at 5.10 o'clock p. m., adjourned until to-morrow, Wednesday, February 28, 1906, at 10.30 o'clock a. m.)

ISTHMIAN CANAL.

COMMITTEE ON INTEROCEANIC CANALS,
UNITED STATES SENATE,
Washington, D. C., Wednesday, February 28, 1906.

The committee met at 10.30 o'clock a. m.

Present: Senators Millard (chairman), Kittredge, Dryden, Ankeny, Morgan, Taliaferro, and Simmons.

TESTIMONY OF WILLIAM NELSON CROMWELL, ESQ.—Continued.

Senator MORGAN. Mr. Cromwell, yesterday in speaking of a paper that is in the record, concluding on page 1150 of this testimony, you say of that paper:

"It is not a contract. It is a power of attorney to me, as general counsel of the company, written in my name, to accompany broad plans which the board of directors considered. It never matured into anything. It never was consummated, either by subscription or by assent, and it is obsolete and an impracticable thing—proved so to be. It has no life or force of being, did not exist, and never has existed, and is as dead as a doornail."

Was it ever signed?

Mr. CROMWELL. I will make, Senator, the same reply I have heretofore.

Senator MORGAN. What is that?

Mr. CROMWELL. That the whole subject is covered by the seal of professional confidence.

Senator MORGAN. How long would that professional lockjaw last—from the time you were first employed down to this date?

Mr. CROMWELL. It exists now.

Senator MORGAN. When did it begin?

Mr. CROMWELL. It began with my employment, and continues now.

Senator MORGAN. When was that? When was the employment?

Mr. CROMWELL. When was my employment by the New Panama Canal Company?

Senator MORGAN. Yes, sir.

Mr. CROMWELL. In 1896.

Senator MORGAN. And this is 1906. You apply that cloture to all questions asked of you in regard to all of your transactions from that time to this in connection with that company, do you?

Mr. CROMWELL. I do, sir.

Senator MORGAN. Yes; and you refuse to state anything that you have done in connection with their business from 1896 down to 1906?

Mr. CROMWELL. I refuse to state.

(By direction, the stenographer read aloud the last question.)

Mr. CROMWELL. I will reply to specific questions, Senator; I can not reply to general questions.

Senator MORGAN. I understood you to say broadly that you would not answer any question that was connected with the business that you were engaged in for the Isthmian Canal Company.

Mr. CROMWELL. You mean for the New Panama Canal Company?

Senator MORGAN. I mean the New Panama Canal Company, or in that connection. You do?

Mr. CROMWELL. I do so state.

Senator MORGAN. That seems to be broad enough. I do not see how it can be any broader. Now, was all the business that you have transacted in connection with that company from that date—1896 to 1906—professional?

Mr. CROMWELL. Yes, sir.

Senator MORGAN. Was this contract you made with them professional?

Mr. CROMWELL. That is not a contract.

Senator MORGAN. What is it?

Mr. CROMWELL. It speaks for itself.

Senator MORGAN. What do you call it?

Mr. CROMWELL. I do not choose to call it anything.

Senator MORGAN. You have called it something. You called it an abortion yesterday, did you not?

Mr. CROMWELL. I did not.

Senator MORGAN. Well, the record states that you did.

Mr. CROMWELL. The record states that you stated so. I did not. I said it was "abortive."

Senator MORGAN. "Abortive"—oh, yes; we change to the adjective phrase.

Mr. CROMWELL. You used the phrase; I did not.

Senator MORGAN. In what sense do you use that word "abortive?"

Mr. CROMWELL. I do not care to make any further explanation of it, Senator.

Senator MORGAN. Do you use it to show that it was never executed—I mean that the papers were never signed?

Mr. CROMWELL. I do not care to make any further explanation of it.

Senator MORGAN. Or do you use it to show that it was never carried out?

Mr. CROMWELL. I make the same reply.

Senator MORGAN. What efforts did you make to carry it out?

Mr. CROMWELL. I make the same reply.

Senator MORGAN. To whom did you submit it for the purpose of carrying it into effect?

Mr. CROMWELL. I make the same reply.

Senator MORGAN. What person not connected in any way with the Panama Canal did you submit that to in order to carry it into effect—to get them to cooperate with you in your effort?

Mr. CROMWELL. I make the same reply, Senator.

Senator MORGAN. It is called a plan for the "Americanization" of

the canal. What does that mean? What is the meaning of that word "Americanization?"

Mr. CROMWELL. I have no explanation to make, Senator.

Senator MORGAN. Do you know?

Mr. CROMWELL. I have no explanation to make, sir.

Senator MORGAN. Do you know?

Mr. CROMWELL. I have no explanation to make. If I have any knowledge, it is knowledge acquired in my professional capacity.

Senator MORGAN. Have you any knowledge—

Mr. CROMWELL. I have no knowledge.

Senator MORGAN (continuing). In regard to that subject—why it should be called a plan for the Americanization of the canal?

Mr. CROMWELL. Whatever knowledge I have acquired upon that subject I have acquired in a professional capacity.

Senator MORGAN. Did you not originate that phrase yourself?

Mr. CROMWELL. Whatever duty I performed in the subject was done in a professional capacity.

Senator MORGAN. Did you not project the plan of Americanizing the canal through that syndicate agreement?

Mr. CROMWELL. I decline to answer for the same reason.

Senator MORGAN. Well, your case of lockjaw seems to be getting worse. I do not understand why it is so strenuous and so bad. It is the most extraordinary case I ever encountered. What was done by any other person, within your knowledge, not connected with the canal company, to carry that contract into effect?

Mr. CROMWELL. I make the same reply.

Senator MORGAN. To whom did you distribute copies of that contract and project for the purpose of getting them to assist in it by subscriptions?

Mr. CROMWELL. I make the same reply.

Senator MORGAN. Did you submit it to anybody?

Mr. CROMWELL. I make the same reply.

Senator MORGAN. What was your purpose in projecting and attempting to execute that contract?

Mr. CROMWELL. I make the same reply.

Senator MORGAN. You got a corporation created in New Jersey, did you not?

Mr. CROMWELL. I make the same reply.

Senator MORGAN. You are a subscribing witness to that act of incorporation?

Mr. CROMWELL. I make the same reply, sir.

Senator MORGAN. Did you prepare it?

Mr. CROMWELL. I make the same reply, sir.

Senator MORGAN. The records of the government in New Jersey show that you obtained that corporation, and that you are a subscribing witness to it. Why did you not object to making that communication to the world at that time, if it was professional?

Mr. CROMWELL. I make the same reply, sir.

Senator MORGAN. Having made it, why do you object to testifying in regard to it?

Mr. CROMWELL. I make the same reply, sir.

Senator MORGAN. You are not shutting out any information by these facts that I know of.

Senator KITTREDGE. Why do you ask the question of the witness, then?

Senator MORGAN. I want to see if this witness can be induced to tell the truth on any point in this case, if the Senator wants to know my purpose. If the Senator takes up the argument against my questions and makes no more objection to them than that, I want to see if he can be induced to tell the truth upon any point in this case. That is my purpose.

Senator KITTREDGE. I am glad to ascertain it.

Senator MORGAN. Has the Senator any further objection to my proceeding?

Senator KITTREDGE. Not at present.

Senator MORGAN. I think, Mr. Chairman, that if a Senator has an objection to make to any question I ask, he ought to address himself to the chair in the form of an objection, and let the question be passed upon by the committee. I do not choose to be interrupted in this way.

[To the witness.] Did you assist in writing a report of a minority to the Senate of the United States, signed by Mr. Hanna and Mr. Kittredge?

Mr. CROMWELL. I make the same reply.

Senator MORGAN. Do you deny that you did assist?

Mr. CROMWELL. I make the same reply.

Senator MORGAN. What connection had the Panama Canal Company with writing that report?

Mr. CROMWELL. I make the same reply.

Senator MORGAN. You, then, apparently do not propose to answer any question that I ask you on this subject?

Mr. CROMWELL. Upon no subject that relates to the performance of my professional work have you a right to ask me any question, and you ought to know it.

Senator MORGAN. Is it any part of your professional duty to the Panama Canal Company to assist a Senator in writing a report?

Mr. CROMWELL. I have not said that I did.

Senator MORGAN. Did what?

Mr. CROMWELL. I have not said that I did so.

Senator MORGAN. I have asked you whether you did or not.

Mr. CROMWELL. I make the same reply.

Senator TALIAFERRO. Bring out what that report was.

Senator MORGAN. The report made by this committee to the Senate—the minority report. I will present it in due season. I would not have done so if I had not been interrupted.

Mr. Cromwell, did you have any part in any conference with Bunau-Varilla, or in any conference with Mr. Hay, or in any conference with any of the authorities of the Republic of Panama, in negotiating the treaty called the Hay-Varilla treaty?

Mr. CROMWELL. I make the same reply.

Senator MORGAN. What is that reply?

Mr. CROMWELL. That all my service in every respect was as counsel of the New Panama Canal Company and covered by the obligation of professional confidence.

Senator TALIAFERRO. May I ask one question there?

Senator MORGAN. Yes.

Senator TALIAFERRO. Do you mean for your answer to apply to the question as to your assisting in the preparation of that minority report?

Mr. CROMWELL. I do, sir.

Senator MORGAN. That you were counsel for the New Panama Canal Company?

Mr. CROMWELL. I did not say, sir, that I assisted in the preparation of the report. I say that I am counsel for the New Panama Canal Company.

(At the request of Senator Taliaferro, his question was read aloud by the stenographer as follows:)

"Do you mean for your answer to apply to the question as to your assisting in the preparation of that minority report?"

Senator MORGAN. What is that?

Senator TALIAFERRO. That is what I asked the witness—if that applied to the question of Senator Morgan in regard to his participation in the preparation of the minority report referred to by Senator Morgan.

Mr. CROMWELL. My answer includes every service in every aspect of the subject. I am trying to answer you, Senator.

Senator TALIAFERRO. I want to get that straight.

Mr. CROMWELL. Yes, sir.

Senator TALIAFERRO. In the first place, Senator Morgan asked you if you assisted in the preparation of a minority report on this canal subject which was presented to the Senate. You decline to answer?

(Mr. Cromwell nodded his head, indicating assent.)

Senator TALIAFERRO. You stated later—

Senator MORGAN. I do not want any head nodding; I want words—language; not nodding of your head.

Mr. CROMWELL. No, no, no; I am not answering now.

Senator TALIAFERRO. You stated later, Mr. Cromwell, that your refusal to answer was because these relations were those of counsel to client.

Mr. CROMWELL. Yes, sir.

Senator TALIAFERRO. And that in all these matters you were the attorney for the canal company?

Mr. CROMWELL. Yes, sir.

Senator TALIAFERRO. The French company?

Mr. CROMWELL. Yes, sir.

Senator TALIAFERRO. I asked you if you intended that answer to apply to the question of Senator Morgan, with reference to your participation in the preparation of that minority report?

Mr. CROMWELL. To that I answer yes, sir; I so intended.

Senator TALIAFERRO. So that, Mr. Cromwell, if you participated in the preparation of the minority report, which was against the Nicaragua Canal and in favor of the Panama Canal, you were acting as the attorney for the Panama Canal Company?

Mr. CROMWELL. Whatever information I may have furnished in that regard was in behalf of the Panama Canal Company and as its counsel.

Senator MORGAN. Did you furnish any information?

Mr. CROMWELL. I did not say so.

Senator MORGAN. Why do you refer to information which you may have furnished? Why not say you did not furnish any?

Mr. CROMWELL. Because the Senator's question was with an "if."

Senator MORGAN. I ask you, now, Did you furnish any information?

Mr. CROMWELL. I make the same reply—that I decline to answer.

Senator TALIAFERRO. Mr. Cromwell, did you negotiate the understanding between the Secretary of War and the Republic of Panama and the banks on the Isthmus?

Mr. CROMWELL. I performed, sir, in regard to that, some work and service which I will be happy to state to you.

Senator TALIAFERRO. I should be very glad to hear it, Mr. Cromwell.

Mr. CROMWELL. I do not know to what extent, Senator, you would like to have me speak of it; but I am very glad to tell you anything that you want to know.

Senator TALIAFERRO. I should like to have as full a statement of it as you care to make.

Mr. CROMWELL. Yes, sir; quite so. It is quite within——

Senator TALIAFERRO. If you wish to look at that agreement before you make your answer, I will give it to you.

Mr. CROMWELL. Quite so, Senator. That is a topic as to which I feel that you have the fullest liberty to interrogate me, and regarding which, of course, there is no seal of confidence.

Senator MORGAN. I hope the Senator will avail himself of that liberty that Mr. Cromwell gives him, and proceed with the full examination.

Senator DRYDEN. What is that matter, Senator Taliaferro—an understanding between the United States Government and the banks?

Senator TALIAFERRO. And the banks and the Government of Panama.

Mr. CROMWELL. This subject, Senator Taliaferro and gentlemen, is one of extreme practical interest in the construction of the canal.

Senator MORGAN. Is it connected in any way with your professional duties to the Panama Canal Company?

Mr. CROMWELL. It is not, Senator.

Senator MORGAN. Not at all, you mean?

Mr. CROMWELL. Not at all, sir; and therefore——

Senator MORGAN. Not an outgrowth of those duties?

Mr. CROMWELL. Therefore the sluice box is open, sir, and you may tap it.

Senator MORGAN. Not an outgrowth of those duties, sir?

Mr. CROMWELL. It has nothing to do with them.

Senator MORGAN. It has no reference to them?

Mr. CROMWELL. None, sir.

Senator MORGAN. It has no reference to any duty you ever performed for that company under your engagement as counsel?

Mr. CROMWELL. None, sir.

Senator MORGAN. Nothing whatever?

Mr. CROMWELL. Nothing, sir.

Senator MORGAN. That is delightful.

Mr. CROMWELL. We are in accord for once, and I hope for all, sir.

Senator MORGAN. No; we will have it again, if it is necessary. It is too pleasant to lay down.

Mr. CROMWELL. You seem to enjoy it, and I am sure I am getting a nice vacation. [Laughter.]

Now, the subject, as I say, gentlemen, is really one of practical interest; and we are touching at last something, I think, of real concern in the construction of the canal. The subject of the monetary

relations between the United States and Panama is an intensely practical subject.

Senator MORGAN. Why do you emphasize that word "practical" so particularly?

Mr. CROMWELL. Shall I strike it out?

Senator MORGAN. Yes, sir.

Mr. CROMWELL (to the stenographer). Please strike out the word "practical," because Senator Morgan does not like it.

Senator MORGAN. No; did you say strike it out? I thought you asked me if I would have it out.

Mr. CROMWELL. Would you like to have it out?

Senator MORGAN. Yes.

Mr. CROMWELL (to the stenographer). Take it out.

Senator MORGAN. I did not mean the word; I mean that I want the idea, the reason, why you are so particular in emphasizing the word "practical" in this connection.

Mr. CROMWELL. Yes, sir—only because, Senator, in the practical working, in the daily working, sir, I mean in the actual operation—

Senator MORGAN. You propose to confine your testimony entirely to the practical operations, do you?

Mr. CROMWELL. I will narrate it, sir, and then we will see how much I confine it.

Senator MORGAN. Well, you seem to have pretty much control of the subject here. The committee does not seem to have much to do with you; so go ahead.

The CHAIRMAN. Proceed, Mr. Cromwell, and give us a history of that, if you will, please.

Mr. CROMWELL. The United States has, as you know, upon the Isthmus, twenty or thirty thousand people, some living within the Zone and many without. The class of labor is varied, of many nationalities; and the great body of that labor is densely ignorant. Thousands of them can hardly read or write, and have to be identified by some number or description; so that upon pay-roll days, even, it is a matter of extreme difficulty to identify the individual, requiring the presence of the gang superintendent and other officials, they are so much alike.

These plain people must deal in a simple coin, in a coinage recognized and easily appreciated, having significance from its symbol and size, perhaps rather more than its inherent quality.

It was manifest, therefore, that the coinage of that whole Isthmus must be practically the same, and by "practically" I mean, Senator Morgan, in practical use, for utilization and for currency. A difference of coinage would bring conflict, and, to these poor, ignorant people often rebellion, discontent, dissatisfaction. So that—

Senator ANKENY. But let us get to the pith of the thing.

The CHAIRMAN. Senator Ankeny, I think under the circumstances it would be better to let Mr. Cromwell proceed in his own way.

Senator TALIAFERRO. If a Senator wishes to ask a question, I think it ought to be allowed.

Senator ANKENY. Is that your explanation of why you have two kinds of money? We are plain, practical people, you know.

Mr. CROMWELL. Yes, sir—we have two kinds of money, you say?

Senator ANKENY. Yes; why do you have two kinds of money?

Mr. CROMWELL. Down there?

Senator ANKENY. Yes, sir. Is not that what you are trying to explain?

Mr. CROMWELL. No, sir; they only have one kind of money. They do not have gold there.

Senator ANKENY. We have the peso.

Mr. CROMWELL. The peso is silver.

Senator ANKENY. Is not that money?

Mr. CROMWELL. Yes, sir; but silver money. There is only one coin.

Senator ANKENY. And for practical purposes why not use our dollar, or our own coinage?

Mr. CROMWELL. Because, cutting right—

Senator ANKENY. This is a business affair. It is not connected with the other matters. We have no short cuts in this matter. Why can we not issue our standard dollar from our own mint?

Mr. CROMWELL. Because, sir, it is found in practice that the men will not take your silver dollar. Your silver dollar and your 50 cents is not worth as much as the same sized coin of the Panaman.

Senator ANKENY. You mean in intrinsic value—in weight?

Mr. CROMWELL. It has not the same value.

Senator ANKENY. You mean by double the quantity?

Mr. CROMWELL. No, sir; it has not the same value; it has not the same monetary value. The Panamans have been accustomed, and all the people of the Isthmus and all those who trade upon the Isthmus have been accustomed, to a coin of a certain size, called the peso. I will show you—

Senator ANKENY. I am very familiar with it. I have been in the China trade.

Mr. CROMWELL. Yes, sir; then you know exactly what it is.

Senator ANKENY (continuing). Where we use the "Mex.," you know.

Mr. CROMWELL. I have here one of those pesos, thinking it might interest you, taken from my own library, it being given me by the Panama Government as the first coin struck from the new coinage.

Senator ANKENY. That is made in Philadelphia, I understand?

Mr. CROMWELL. Yes, sir.

Senator DRYDEN. What is that?

Mr. CROMWELL. This is a silver peso. It is of value, in Panama, 50 cents. Now, that same piece of silver—

Senator ANKENY. Fifty cents in our money?

Mr. CROMWELL. In our money. That is in nominal value 50 cents, which would be 25 cents gold. That piece of money I have just handed you—a 50-cent peso—is only in real value 25 cents American money.

Senator ANKENY. That we understand.

Mr. CROMWELL. And yet the 50-cent piece of American money is about the same size. Put them together and see. Consequently, a laborer who would take your 50-cent American piece and offer it at the store would not get the equivalent of 50 cents for it. He would get less than 50 cents of its value, and it is because of that condition—

Senator ANKENY. Will not our standard silver dollar buy twice as many potatoes as the peso?

Mr. CROMWELL. Senator, it ought to; it would be between you and me and between men of equal intelligence; but it will not as between the plain laborer, who goes and buys by means of this piece of silver, and the merchant in the store who deals with him. It is found, sir, in actual practice, not in theory, that the laborers who receive the American money do not get the equivalent of that money when they trade it out in the stores, because it runs in competition with the piece of silver about the same size but only worth half as much. That is the reason; that is one reason, sir.

Senator ANKENY. I did not mean to interrupt you, but I was not clear why that should not be.

Mr. CROMWELL. I know; it is a very practical question, and I thank you for it. Now, as to the reason for the agreement——

Senator TALIAFERRO. Can I see one of those pesos?

Mr. CROMWELL. Yes, sir. You will observe that these are about the same size, gentlemen, as our own coins, and yet they are of only half the value. Now, there, for instance, is a 10-cent silver piece in Panaman. It is only 5 cents American money, and yet it is larger than our 10-cent piece—all these coins I speak of, sir.

Senator ANKENY. A little more intrinsic value?

Mr. CROMWELL. Yes, sir. I will proceed, then, if you desire me to.

Senator ANKENY. I did not desire to interrupt you.

Mr. CROMWELL. I thank you for the interruption; it is very useful.

Senator ANKENY. Proceed with your statement of the monetary arrangement.

Mr. CROMWELL. I thank you. Now, as to the reason for making the monetary arrangement:

Because, therefore, of the necessity of having a silver coinage, it was necessary for the Republic of Panama to increase its coinage adequate to the supplying of the wants of the Isthmus. The original issue of the Panama Government was only ₡3,000,000. It was estimated at that time that there would be existent in Panama old Colombian coins to about the amount of ₡3,000,000. That estimate came out very close. The Congress of the Republic authorized, therefore, the issue of ₡3,000,000. Those were created. The bullion was bought in the United States. The coins—these identical coins—were coined at the mint in Philadelphia and all shipped to Panama—every single one of them. There those coins—the new Panama coins—were, by a law, offered in exchange for the old Colombian coins up to a given date. That date expired February 12 last, and from that hour on the old Colombian coin ceased to have lawful currency on the Isthmus in the Republic and the new coinage went into effect.

That was the state of affairs when it became necessary to make an arrangement for the stability of this coinage. I think I mentioned to you a day or two ago—my recreation has been so long that I have forgotten how long I have been here—that the Panama Government had established the gold standard and had created a reserve fund to establish the parity of this silver coin with the gold coin, this silver coin being worth about 42 or 43 cents.

Senator ANKENY. Intrinsic value?

Mr. CROMWELL. Intrinsic value; yes, sir; and the difference, estimated in round figures at 15 per cent, was deposited by the Republic of Panama in gold with the Bankers' Trust Company, of New York,

under a deed of trust, to which I referred, and a duplicate original of which is on file in the War Department. That establishes the parity, then, of this silver with gold.

Senator ANKENY. Let me interrupt you a moment, with your permission. Is that the only provision you have for the redemption of this money? Have you no customs, nothing you can pay them in upon?

Mr. CROMWELL. Oh, the Republic of Panama has its current revenues and receipts, which about pay its expenses.

Senator ANKENY. Is that reserve fund the only provision for their redemption?

Mr. CROMWELL. That is the only provision for their redemption.

Senator ANKENY. Is that ample, sir, and adequate?

Mr. CROMWELL. It is the difference between the value of the coin—we can redeem these coin any day.

Senator ANKENY. It may depreciate, however.

Mr. CROMWELL. Well, slightly, perhaps; those things fluctuate just like our American coin does. We have in our own Treasury of the United States, as you know so well, a certain sum of money, and yet our own silver dollar to-day is worth less than it was last year.

Senator ANKENY. I was not disposed to be captious about that, but that is all the provision you have for the redemption of this money?

Mr. CROMWELL. That is all the provision we have for it, just as that is all the provision the United States has for the redemption of its silver coin. But while the gold standard had been created, as in the United States, in similitude, and while the parity of this silver coin with gold had been established by the gold reserve fund I have mentioned, the same as does the United States, by holding the reserve in its own Treasury, still we all recognized that there was a danger of fluctuation. There was a lack of stability—in other words, in the current value of this silver—owing to the fluctuations of exchange. You know, for instance, that to-day in Colombia it is about 10,000 to 1, but in Panama it has been as high as 270. Within recent times it has been as high as 217 or 218 or 220. The design was, therefore, to establish a stability to this currency, because only by the establishment of that stability could the value of this coin be maintained for our laborers, for all this mass of servants and all the peoples concerned. In other words, we could not afford to pay out a coin to a laborer which the next day would be depreciated by a violent fluctuation of exchange. That is manifest. So that it became necessary to make some agreement to maintain substantially and closely, as far as human ability would permit, the stability of this currency.

Now, the New Panama Canal Company had met the same difficulty in dealing with the thousands of men it had employed and had made agreements with bankers on the Isthmus very much of the character that you have here. The Panama Railroad Company had met the same difficulty in the hundreds of men it had employed, and it had made agreements of a similar character. It was because of that, after legislation failed at the last session, as you know, owing to the two Houses of Congress failing to come to an agreement and failing to pass the provision designed to aid this subject, that the Secretary of War, knowing that I was familiar with these two other experiences

I have just mentioned with the New Panama Canal Company and the Panama Railroad Company, asked my advice and assistance in meeting this present difficulty. The President of the Republic of Panama had likewise asked my assistance.

Senator MORGAN. You mean you were personally acquainted with those questions, those subjects?

Mr. CROMWELL. Sir?

Senator MORGAN. Do you mean that you had personal experience?

Mr. CROMWELL. Experience only with the effects of these subjects, Senator.

(At the request of Senator Morgan, the portion of Mr. Cromwell's answer referred to was read aloud by the stenographer.)

Senator MORGAN. You are speaking now of your personal experience?

Mr. CROMWELL. Yes, sir. I have had no personal experience, Senator, in the monetary dealings.

Senator MORGAN. No; your personal experience in regard to all the affairs of the Panama Canal Company and the United States?

Mr. CROMWELL. No, sir; I had no personal dealings with these monetary questions at all, sir.

Senator MORGAN. I did not ask about those. I am asking you whether your expression there refers to your experience in regard to all the affairs of the Panama Canal Company and the United States. Is that what you refer to when you say the Secretary of War knew your experience?

Mr. CROMWELL. The Secretary of War knew my experience with reference to the monetary arrangements, with reference to the bankers' agreements.

Senator MORGAN. Yes.

Mr. CROMWELL. With reference to these two bankers' agreements.

Senator MORGAN. And he did not know your experience in regard to other matters connected with this canal?

Mr. CROMWELL. I do not know. I am speaking only of this topic, sir.

Senator MORGAN. Yes; I know what you are speaking on. I want to ask you how broad that expression is. Did he know of your experience, practical and personal, with all the affairs of the New Panama Canal Company since you have been in connection with that company?

Mr. CROMWELL. I do not know, sir; I do not know what the Secretary knew.

Senator MORGAN. Is that what you mean to convey?

Mr. CROMWELL. No.

Senator MORGAN. Is that the idea you mean to convey now?

Mr. CROMWELL. No; I knew he was acquainted with the fact that I knew that the New Panama Canal Company had some agreement with bankers of this general character.

Senator MORGAN. That particular fact?

Mr. CROMWELL. That particular fact.

Senator MORGAN. He did not know anything else about you?

Mr. CROMWELL. I know nothing else of what he knew or did not know.

Senator MORGAN. Yes.

Mr. CROMWELL. He knew that I was aware that the Panama Rail-

road Company had had some similar agreements with bankers for some general need and some general object.

Senator MORGAN. Let me make this inquiry right there, if you please: You mentioned the railroad company. Do these professional obligations you speak of in regard to the Panama Canal Company cover your duties and your transactions with the railroad company and in behalf of the railroad company during all of the period since you have been a director in that company?

(At the request of the witness, the question was read aloud to him.)

Mr. CROMWELL. So far as they relate to the Panama Canal Company, they would so cover. So far as they relate to the railroad company, they would not cover.

Senator MORGAN. That brings up the distinction. In regard to the railroad company, you feel at liberty to make any professional communications or any communication of any facts that you have derived professionally in representing that company as an attorney?

Mr. CROMWELL. I will answer the specific questions as they arise, Senator.

Senator MORGAN. Well, please answer that question.

Mr. CROMWELL. I can not answer any hypothetical questions. When you present to me a question, I will answer it truthfully.

Senator MORGAN. I present it to you now, and demand your answer.

(By direction of Senator Morgan, the stenographer read aloud the pending question.)

Mr. CROMWELL. I will answer specific questions when they are put to me, Senator.

Senator MORGAN. You refuse to answer that question?

Mr. CROMWELL. I do; because it is entirely impracticable for me to answer hypothetical questions.

Senator TALIAFERRO. Mr. Cromwell, you are willing to answer any question that is put to you in relation to your service as an attorney for the railroad company since this Government bought that railroad?

Mr. CROMWELL. Oh, absolutely, sir; certainly, sir.

Senator MORGAN. Well, why could you not answer that question when I put it to you?

Mr. CROMWELL. I beg your pardon, Senator; your question was a different one entirely—

Senator MORGAN. I do not think so. There is not a particle of difference, and you know it.

Mr. CROMWELL (continuing his answer). And antedated the transfer. Your question antedated the transfer. Since the transfer my duty is to the Government, which I will perform to the letter.

(By direction, the stenographer again read aloud the following question:)

"In regard to the railroad company, you feel at liberty to make any professional communications or any communication of any facts that you have derived professionally in representing that company as an attorney?"

Mr. CROMWELL. Since the transfer—yes, sir.

Senator MORGAN. What transfer?

Mr. CROMWELL. The transfer to the United States.

Senator MORGAN. By whom?

Mr. CROMWELL. By the New Panama Canal Company.

Senator MORGAN. And not before?

Mr. CROMWELL. I will answer specific questions as to any period anterior.

Senator MORGAN. That is a specific question. And not before? You are not willing to answer as to anything that occurred before that time?

Mr. CROMWELL. That will depend, sir, upon the character of the question.

Senator MORGAN. You are not willing to answer any question, as I understand you, before the date of the transfer, in regard to your connection with the railroad company, because you are its lawyer? Do you understand that?

Mr. CROMWELL. Yes, sir.

Senator MORGAN. Well, are you?

Mr. CROMWELL. I decline to state whether I will or will not answer any question relating to a period anterior to May 4, 1904, until the question is specifically put to me. I will answer no hypothetical and general questions.

Senator MORGAN. Well, Mr. Chairman, this gentleman seems to have the entire control of the committee, so far as I can see. I suppose I must take his orders. There seems to be no interposition on the part of the Chair or anybody to require a question to be answered. I move that the witness be required to answer that question.

The CHAIRMAN. If the witness declines to answer it, Senator, you have your remedy.

Senator MORGAN. Does the committee require him to answer it?

The CHAIRMAN. I have not put it to the committee whether he shall answer the question or not.

(By direction, the stenographer read aloud the pending question, as follows:)

" You are not willing to answer any question, as I understand you, before the date of the transfer, in regard to your connection with the railroad company, because you are its lawyer? "

(The stenographer was also directed to read the answer of the witness, as follows:)

" I decline to state whether I will or will not answer any question relating to a period anterior to May 4, 1904, until the question is specifically put to me. I will answer no hypothetical and general questions. "

Senator MORGAN. I ask the witness to state whether he takes shelter under his professional confidence in regard to the transactions of the railroad prior to the date of the transfer.

Mr. CROMWELL. I repeat the reply I have already made.

(Upon motion, the roll of the committee was called, as follows:)

The CLERK. Senator Kittredge?

Senator KITTREDGE. I vote "no."

The CLERK. Senator Dryden?

Senator DRYDEN. Just what is the question? The question is whether the witness shall be required to answer that question?

Senator KITTREDGE. Yes, sir.

Senator DRYDEN. I vote "no," on the ground that the witness is entitled to demand that the question asked him shall be specific and particular.

The CLERK. Senator Ankeny?

Senator ANKENY. No.

The CLERK. Senator Morgan?

Senator MORGAN. I vote "aye."

The CLERK. Senator Taliaferro?

Senator TALIAFERRO. Aye.

The CLERK. The Chairman?

The CHAIRMAN. No.

The CLERK. There are 4 noes and 2 ayes.

The CHAIRMAN. There are 4 noes and 2 ayes; the motion is lost.

Senator MORGAN. Well, go ahead now, Mr. Taliaferro.

The CHAIRMAN. Proceed, Mr. Cromwell.

Mr. CROMWELL. The difficulty being of the character I have tried to explain, gentlemen (and which I fear, with the interruptions that have been necessarily made, may not be as consecutive as desirable), I assisted the Secretary of War, the chairman and the president of the Commission and railroad company, respectively, in reaching the agreement which is before you, dated April 29. That was the result of many conferences with bankers of the Isthmus, who came to New York at the request of the Secretary of War for the purpose, and with the officers of the American Banking Corporation, a banking institution of the United States having, as you may know, a branch on the Isthmus. The principal bankers of the Isthmus, gentlemen, are the firms of Ehrmann & Co., Brandon & Co., the American Trade Developing Company—

The CHAIRMAN. Mr. Cromwell, is that a banking or a mercantile institution?

Mr. CROMWELL. A mercantile institution. I will explain them each, if you please, sir. These three concerns are the principal banking concerns on the Isthmus.

The first, Ehrmann & Co., have been in business for about half a century there—a very honorable, high-toned concern. The late head of that firm, Henry Ehrmann, was the consul of the United States at that port for many years. Messrs. Isaac Brandon & Bros. have been in business there as general merchants and bankers for forty years, perhaps. The American Trade Developing Company has been in trade for ten or fifteen years.

Senator TALIAFERRO. I think it is not necessary to describe those houses.

Senator MORGAN. I hope the witness will be indulged in his eulogies upon those companies. They are very important.

Senator TALIAFERRO. I think if you will just explain the effect and purpose of the arrangement in the first place, and the effect practically, that will be sufficient.

Mr. CROMWELL. With these concerns and the American concerns this agreement was reached, by which the difficulties I have indicated, were overcome. In effect it provides and agrees that the bankers named, who constitute about 90 per cent of the banking facility of the Isthmus, will furnish to the United States, through the railroad company and the Commission, upon its ten-day call, all the silver which is required, without limit, at the uniform rate of 2 pesos for \$1 gold, without any premium. That provides for the great mass of our labor there, who receive the 2 silver pesos as the equivalent for \$1 American gold.

Senator MORGAN. Let me ask whether the mints of the United

States were not capable of furnishing all the silver we could use there?

Mr. CROMWELL. You could furnish silver, Senator; but, as I described or tried to describe a while ago, the belief exists generally that the American silver, when put in circulation there would, for the reasons I have described, be less acceptable than the Panama coin, because, being about of the same size (as I was explaining, Senator Simmons, before you came in), they deceive the eyes and senses of these thousands of ignorant people who only go by the senses and not by the values.

Senator MORGAN. Have you got those coins there? I have not seen them.

Mr. CROMWELL. Would you like to see them?

Senator MORGAN. Yes; one of those pesos.

(Mr. Cromwell handed to Senator Morgan one of the pesos referred to, and explained informally to Senator Simmons what he had already stated in regard to the comparative value of Panaman and American currency.)

Mr. CROMWELL. In other words, they would be fooled; the ignorant people would not get their money's worth. They would not physically do it, of course; you would not permit them to do it.

Senator MORGAN. Is there anything in the new arrangement that prevents their being fooled?

Mr. CROMWELL. By getting this silver they do not get fooled. That is just the object. By having one coinage they would not be fooled. That is the object of it.

The CHAIRMAN. Well, now, Mr. Cromwell, please get along with this money question as rapidly as you can, so that we will get through here.

Senator MORGAN. Well, I want to ask him a question.

The CHAIRMAN. Oh, very well, Senator Morgan.

Senator MORGAN. Could not the United States mints provide coins of the same size, dimensions, and value, without being required or necessitated to get their supply from the banks in Panama.

Mr. CROMWELL. Oh, I have no doubt the mint could make a coin of as little intrinsic value as this if they chose, sir.

Senator MORGAN. And use it?

Mr. CROMWELL. No doubt.

Senator MORGAN. Very good.

Mr. CROMWELL. Oh, undoubtedly, sir. The only objection on that score is one of the present currency. There would have to be a special coinage.

The second advantage—I am answering now your question, Senator Taliaferro—the first advantage was to furnish to the United States all the silver it wanted—that is, furnished at par, two for one, without any premium.

Senator DRYDEN. Furnished to Panama, do you mean? I think you said the United States. Do you mean furnished to Panama?

Mr. CROMWELL. I mean furnished to the United States.

Senator DRYDEN. Oh, by the Government of Panama?

Mr. CROMWELL. No; these bankers furnish to the United States, to the railroad, and the Commission all the silver coinage that it calls for, without any premium whatever.

Senator DRYDEN. I understand.

Mr. CROMWELL. They furnish, further, under this agreement, Article C, all the United States currency which may be desired there at the premium of only three-fourths of 1 per cent in gold.

Senator TALIAFERRO. Well, Mr. Cromwell, let us understand what you mean by stating that they furnish all the silver we want.

Mr. CROMWELL. Yes, sir.

Senator TALIAFERRO. Free of charge?

Mr. CROMWELL. Yes, sir.

Senator TALIAFERRO. Do they not furnish us silver on the Treasury drafts, for which they charge three-fourths of 1 per cent?

Mr. CROMWELL. No, sir; they do not, Senator. That is a curious and most important thing. I have read the testimony upon that subject, and everybody seems to be befogged about it. It is absolutely incorrect. (I mean the witnesses; I do not mean the Senators.) It is absolutely incorrect. The agreement is very simple; it is magnificent and useful. I could state it, if you would permit me, in three minutes, without interruption.

The CHAIRMAN. We will give you the three minutes. Go right along and state it.

Mr. CROMWELL. You get all the silver you want, two for one, without any premium.

Senator TALIAFERRO. By turning in—

Mr. CROMWELL. By merely turning in your piece of paper called a draft, on which the banker does not get his money back until he sends it to the New York treasury and collects it, ten days after.

The CHAIRMAN. With no charge?

Mr. CROMWELL. Without any charge; no commission; nothing. Now, second, you get all the United States currency you want there at the premium of only three-fourths of 1 per cent in gold, considered to be the equivalent of the shipment, transmission, insurance, etc., of gold.

Senator TALIAFERRO. If you are correct about this, the other witnesses, apparently, have not understood it.

Mr. CROMWELL. I think they thoroughly explained it, but not so clearly as I am explaining it to you, Senator.

Senator SIMMONS. I have understood all the witnesses who testified up to this time to say that when a draft upon the United States Treasury was presented to one of these banks, the banks charged them a commission for collecting that draft.

Mr. CROMWELL. Senator, with the greatest respect, have you read the testimony—freshly, I mean?

Senator SIMMONS. Well, I have heard it.

Mr. CROMWELL. I mean I would not venture to check your judgment if you had; but that is not a correct statement, sir, of the case, whoever said it, if it be said; and, as I read the testimony, they do not quite so state. At any rate, that is not the working of the agreement.

The agreement is exactly as I have stated it, and it works exactly as I have stated it, and you only have to call before you a man competent to state it from the Treasury Department here to find it out—namely, that you get all the silver you want upon ten days' notice, at two for one, without a dollar of cost or without a cent of commission on the drafts. That is the way it works, every day of the week.

Senator TALIAFERRO. Will you refer me to the provision in that understanding that justifies that statement?

Mr. CROMWELL. Yes, sir; Article A—"The bankers agree," etc.

Senator TALIAFERRO. "The bankers severally agree"—is that what you are reading?

Mr. CROMWELL. Yes, sir; on page 36.

Senator TALIAFERRO. Well, read that through.

Mr. CROMWELL. I will, sir. I will omit the names. [Reading:] "The bankers severally agree with the Commission, the railroad company, the Republic, and with each other to purchase and take in the proportion following, namely."

Then naming the following proportions.

Senator TALIAFERRO. Skip the bankers.

Mr. CROMWELL (reading): "All drafts or bills of exchange on New York which may be drawn by the Commission, the railroad company, or the Republic by the duly authorized officer or representative of either and made payable at New York at sight in United States currency at the uniform rate of 2 silver pesos Panama currency for each dollar of United States currency, which either of said three last-named parties may offer for sale to and request to be purchased by the bankers, and to pay for the same in silver coin of Panama currency."

That is all. Where is there a word of suggestion of commission? There is nothing in it. I drew the agreement. I made the negotiation, and I know the fact.

The CHAIRMAN. Proceed, Mr. Cromwell.

Mr. CROMWELL. I am proud of it. There was not a dollar; there was not a centime of commission paid in respect of that.

Second. You get all the United States currency that you desire at a premium of but three-quarters of 1 per cent gold.

And third. Having protected, then, the Commission, both as to the silver it might desire and the United States currency that it might desire, we went further and protected the public—the broad commercial world and our laborers, who are a part of the public—and as to them we provided that no longer should there be this wide fluctuation up to 270 or any soaring figures, the value of which would affect the value of our labor there, but that it should be brought down to only a premium of 1½ per cent gold. And these bankers are compelled by this agreement, by Article C, Senator—

Senator TALIAFERRO. Read that Article B; just read that to the committee.

Mr. CROMWELL. Article B relates to another subject.

Senator TALIAFERRO. Just read it, please.

Mr. CROMWELL (reading): "Article B. The bankers also likewise severally agree to sell and deliver to the Commission, the railroad company, and to the Republic in the proportions aforesaid all drafts or bills of exchange on New York to be drawn by them, respectively, and to be payable at one day's sight in United States currency at the uniform rate of 2 silver pesos and 1 cent Panama currency for each \$1 of United States currency, which either of said three last-named parties may request to be to them so sold upon payment for the same in silver currency of Panama: *Provided*, That ten days written notice"—

Senator TALIAFERRO. Never mind the proviso. Now, what is the difference between that provision—you do not pretend to say that we get the exchange from Panama without payment?

Mr. CROMWELL. No, sir. If you want to buy exchange then it is another matter.

Senator TALIAFERRO. How do you differentiate between that exchange agreement and the currency agreement in Paragraph A?

Mr. CROMWELL. I understand Paragraph B is practically obsolete; that the United States does not ask for or seldom, if ever, avails itself of that provision.

Senator TALIAFERRO. I ask you how you differentiate. You say that the provision in Paragraph A does not require the payment by this Government of any charge, cost, or exchange where currency is furnished on the Isthmus.

Mr. CROMWELL. Where Panama silver is furnished.

Senator TALIAFERRO. Where Panama silver is furnished on the Isthmus?

Mr. CROMWELL. Yes, sir.

Senator TALIAFERRO. Now, the language of that provision seems to be practically the same as that in Paragraph B. It provides for the purchase of exchange, and yet you say that the provision in Paragraph B requires the payment for exchange, while the similar provision in Paragraph A does not require the payment for silver on exchange.

Mr. CROMWELL. The difference lies in this, that under Paragraph A the actual silver is delivered on the spot against the draft of the United States.

Senator TALIAFERRO. Do you state to your knowledge, Mr. Cromwell, that the operation of this agreement is that the United States Government is not required by the bankers on the Isthmus to pay anything for exchange where they give to this Government silver in lieu of the exchange?

Mr. CROMWELL. That is my understanding, sir. I am not present at the physical operations, of course, but that is my understanding, sir.

Senator TALIAFERRO. The testimony of all the witnesses who have preceded you has led this committee to understand that this agreement required the payment of three-fourths of 1 per cent on every draft drawn on the Isthmus, and required that every draft drawn on the Isthmus should be passed through these banks at that rate. If there is any member of the committee that does not understand it as I state it, I would be glad for him to say so now.

Senator KITTREDGE. Judge Magoon testified otherwise, Senator.

Senator TALIAFERRO. Where is the testimony?

Senator KITTREDGE. I have not a note of it, but I am very clear that he stated it substantially as Mr. Cromwell does.

Senator TALIAFERRO. I did not understand it so.

Senator KITTREDGE. The exchange only applied, according to his statement and his testimony, to American money. Otherwise there was no exchange.

Senator MORGAN. Did you draw that paper?

Mr. CROMWELL. Yes, sir; I did draw it—yes, sir; largely. It was drawn by two or three of us.

Senator MORGAN. You drew the whole of it?

Mr. CROMWELL. It was drawn by two or three of us.

Senator MORGAN. You led in the drawing of it?

Mr. CROMWELL. I made the general first project, and then it was revised by the lawyers for the other parties.

Senator MORGAN. Some amendments were put into it. You mentioned one article as being obsolete. Which is that?

Mr. CROMWELL. I mean very seldom employed. Article B is very seldom employed.

Senator MORGAN. Does that justify the remark that it is obsolete?

Mr. CROMWELL. It would not justify the use of that word; no, sir.

Senator MORGAN. Is that article in force?

Mr. CROMWELL. Quite so; yes, sir. I mean by obsolete that it is seldom used. So that the agreement provides for the furnishing of currency at two for one without charge, and it provides for furnishing it to the public at the uniform rate of $1\frac{1}{2}$ per cent premium.

Senator MORGAN. In drawing that paper, did you act as the fiscal agent of the Government of Panama?

Mr. CROMWELL. I did, sir.

Senator MORGAN. Had they appointed you fiscal agent for that purpose?

Mr. CROMWELL. They did appoint me fiscal agent for that purpose.

Senator MORGAN. Were you then representing the Panama Canal Company?

Mr. CROMWELL. No, sir; not in this affair.

Senator MORGAN. Or in any affair?

Mr. CROMWELL. I am the general counsel in anything that might arise.

Senator MORGAN. Were you representing the Panama Railroad Company?

Mr. CROMWELL. Yes, sir.

Senator MORGAN. And also the Government of Panama?

Mr. CROMWELL. Yes, sir.

Senator MORGAN. The railroad belongs to the United States?

Mr. CROMWELL. I was at that time attorney for the railroad company, and I was attorney for the Republic of Panama as well as its fiscal commissioner.

Senator MORGAN. You had both the office of attorney for the Panama Republic and that of fiscal commissioner?

Mr. CROMWELL. Yes, sir.

Senator MORGAN. So that there were three offices that you held in that connection?

Mr. CROMWELL. The United States Government was represented on the Commission and the Panama Railroad by its own officers.

Senator MORGAN. Was the United States, as the owner of the railroad company, interested in this transaction?

Mr. CROMWELL. Vitally so; yes, sir.

Senator MORGAN. So that you represented both sides?

Mr. CROMWELL. I did not represent them. They represented themselves in that sense. The president and board of directors of the Panama Railroad Company considered these questions most fully and most carefully.

Senator MORGAN. Did you cease, then, to represent the Panama Railroad Company as its counsel on that occasion?

Mr. CROMWELL. I did not. I did represent them on that occasion.

Senator MORGAN. Well, then, you represented the Panama Railroad Company, which belongs to the United States?

Mr. CROMWELL. Yes, sir.

Senator MORGAN. And also the Government of Panama?

Mr. CROMWELL. Yes, sir.

Senator MORGAN. Both as fiscal agent and as general attorney?

Mr. CROMWELL. I did.

Senator MORGAN. You certainly are authorized to speak on the question.

Mr. CROMWELL. I acted as joint adviser on both sides, and I am very proud of the agreement.

Senator MORGAN. You are proud of the agreement?

Mr. CROMWELL. Which brought such great benefit to the United States. By it we were able to avoid the deposit of one and a half million dollars, as had been voted by the Senate, and to avoid any risk of involvement of United States moneys. We were able to accomplish an agreement by which the Commission and the railroad company is furnished with all the silver it wants, at 2 for 1, without any premium.

Senator MORGAN. So that in these various capacities in which you were acting, you were about the whole thing, were you not?

Mr. CROMWELL. I was part of it, sir. The Secretary of War and myself had many, many conferences, most anxiously about it. The chairman of the Commission and the president of the railroad company and myself had serious conferences about it, and gave the fullest and most anxious consideration to the working out of the agreement, to meet a difficulty that existed.

Senator SIMMONS. Did the Secretary of State understand, and did the Commission understand, and did the president of the railroad and the railroad directors understand that at that time you were representing the Republic of Panama in making this agreement?

Mr. CROMWELL. They did, sir; fully and unequivocally. My relations are open and aboveboard, and known to all the world.

Senator MORGAN. Will you kindly explain what interest the Republic of Panama as a government had in this business?

Mr. CROMWELL. Its interest, sir, was almost nominal. It had agreed with the United States to assist all it could in obtaining that parity, and it was important to have it a party to the agreement, because we wanted the moral force and influence upon all bankers of the Isthmus of the Government of Panama's signature to this agreement.

Senator MORGAN. Does the Government of Panama own any interest in those banks?

Mr. CROMWELL. No, sir.

Senator MORGAN. Did they have any deposits with them?

Mr. CROMWELL. I do not know.

Senator MORGAN. You stated here that they had deposited \$200,000; did you not, and was not that a part of the investment?

Mr. CROMWELL. I think the Government of Panama had deposited in one or two of the banks there.

Senator MORGAN. How much?

Mr. CROMWELL. They had originally a deposit of \$450,000. It is now \$150,000, I am told.

Senator MORGAN. So that the Government was a depositor in those banks?

Mr. CROMWELL. The Government of Panama; yes, sir.

Senator MORGAN. Are those banks chartered by law in Panama?

Mr. CROMWELL. No, sir. They are not banks, sir, in the ordinary sense. There never has been a bank on the Isthmus of Panama, curious to say.

Senator MORGAN. They are all mercantile establishments?

Mr. CROMWELL. Yes, sir. And that is the reason it is necessary to have these particular people. This is the curious situation: They receive this silver in the course of their business—their commercial affairs—and that is the reason it is necessary to deal with these particular people. You can not get the silver, curiously enough, anywhere else.

Senator MORGAN. You mean the coin silver?

Mr. CROMWELL. The actual coin.

Senator MORGAN. You could have got it from the United States Mint, could you not?

Mr. CROMWELL. You could not have got the Panama coinage there.

Senator MORGAN. Could you not have had it made there, if you wanted to?

Mr. CROMWELL. Not without a special statute, I imagine, sir, making the coin of an adequate character.

Senator MORGAN. By enacting a special law we can do it?

Mr. CROMWELL. I think you could, sir. May I suggest one more thought, in view of the questions that have been asked, regarding the relation that I now occupy in respect of the Panama Railroad and the Panama Government? I wish to state this distinctly: The relations of the Panama Government were rather nominal and more for the purpose of their moral influence. I do not think they have ever drawn a single draft or had any transaction under the agreement. The business was conducted really for the benefit of the Commission and the railroad company. As such I was attorney for the railroad company. As such I conferred with the officers of that company and with the Secretary of War as the representative of the stock of that company. The agreement was reached with the greatest care, attention, study, and devotion.

I only want to add one further word, and that is—though I hardly think it is necessary to state it, yet the questions which have been asked prompt me to make the remark—that in none of these institutions or in any of their allies have I ever had, nor have I now, the remotest financial or other interest. I am not even counsel for any of them, and have not the remotest connection with the affair except that which I have stated.

Senator SIMMONS. I may have misunderstood you, but I understood you to say yesterday that you did not receive any compensation as an attorney from the Republic of Panama.

Mr. CROMWELL. That is true, sir.

Senator SIMMONS. For what consideration were you representing them as fiscal agent in making this transaction?

Mr. CROMWELL. What do you mean by "what consideration?"

Senator SIMMONS. I mean what was the inducement to you to represent them? You got no money for it; you were not employed as

counsel; you were not paid as fiscal agent. What was the inducement or consideration to you to perform that service for the Republic of Panama?

Mr. CROMWELL. The broad instinct of good nature, which has prompted me to do so much work for that cause, Senator, and the other consideration that I have more money than I need, unfortunately.

Senator MORGAN. Did that broad instinct of good nature lead you also to take out the act of incorporation which is here on page 23 of the report of the Committee on Interoceanic Canals, made to the Senate, Fifty-sixth Congress, first session, to which I will call your attention, and to which you were a subscribing witness?

Mr. CROMWELL. Are you still harping on our daughter, going back to that subject? She is an old maid by this time, and I think we had better get her married to somebody. [Laughter.]

Senator MORGAN. She is a harp of many strings, I discover. [Laughter.] So you must excuse me if I want to know her better.

I read from this report of the Committee on Interoceanic Canals that I have referred to. (Reading:)

SHIP CANALS IN THE ISTHMUS OF DARIEN.

May 21, 1900.—Ordered to be printed.

Mr. Morgan, from the Committee on Interoceanic Canals, submitted the following supplemental report (to accompany H. R. 2538):

The Committee on Interoceanic Canals report the following certified copies of charters of corporations of New Jersey relating to ship canals in the Isthmus of Darien, and request that the same be printed as a document for the use of the Senate:

CERTIFICATE OF CORPORATION OF PANAMA CANAL COMPANY OF AMERICA.

UNITED STATES OF AMERICA,

State of New Jersey:

We, the undersigned, hereby do associate ourselves into a corporation, under and by virtue of the provisions of an act of the legislature of the State of New Jersey, entitled "An act concerning corporations (revision of 1896)," and the several acts amendatory thereof and supplemental thereto, for the purposes hereinafter named, and do make this our certificate of incorporation.

First. The name of the corporation is Panama Canal Company of America.

Second. The location of the principal office of the corporation in the State of New Jersey is at 76 Montgomery street, in Jersey City, in the county of Hudson, and the name of the agent therein and in charge thereof, upon whom process against this corporation may be served, is William Brinkerhoff.

Third. The objects for which the corporation is formed are as follows:

To acquire, by purchase or otherwise, the maritime ship canal of the Compagnie Nouvelle du Canal de Panama and the railway across the Isthmus of Panama between the Atlantic Ocean and the Pacific Ocean; to construct, exploit, complete, equip, repair, and enlarge; to operate, manage, maintain, and control said canal and railway and

the various enterprises connected therewith; to collect tolls and revenues therefrom, and to use and enjoy the same.

To acquire, by purchase or otherwise, and to construct, operate, exploit, manage, and control lines of railway along or in the vicinity of such canal.

To acquire, by purchase or otherwise, and to construct, operate, and exploit, manage, and control cable lines, telegraph lines, and telephone lines along and to connect with such canal and such railway or railways, and in and along the shores of the oceans, seas, gulfs, and bays at, near, or to connect with such canals or railways.

To acquire, by purchase, lease, or otherwise, and to construct, maintain, operate, manage, and control, and to sell, let, pledge, or otherwise dispose of ships, boats, and other vessels of every kind and nature, and propelled by any power; to acquire concessions, grants, privileges, or licenses for the establishment and working of lines of steamships or sailing vessels, and to establish and to maintain lines or regular services of steamships or other vessels between any ports of the world, and generally to carry on the business of shipowners, and to enter into contracts for the carriage of mails, passengers, goods, and merchandise by any means, either by its own vessels, railways, and conveyances, or by the vessels, conveyances, and railways of others; and to collect, use, and enjoy revenues therefrom.

To construct, purchase, take on lease, or otherwise acquire, and to maintain, use, and manage wharves, warehouses, piers, docks, buildings, or works capable of being advantageously used in connection with the canal, shipping, carrying, or other business of the company; and to charge and collect dues and rentals for the use thereof.

To construct, purchase, or otherwise acquire, and to own, equip, improve, work, develop, manage, and control public works and conveniences of all kinds, including railways, docks, harbors, light-houses, piers, wharves, canals, conduits, locks, reservoirs, irrigation works, tunnels, bridges, viaducts, embankments, buildings, structures, and any and all other works of internal improvement or public utility.

To enter into any arrangements with any governments or authorities, national, State, municipal, local, or otherwise, that may seem conducive to the company's objects or any of them, and to obtain from any such government or authority any and all rights, privileges, grants, and concessions which the company may think it desirable to obtain and to carry out, exercise, and comply with any such arrangements, rights, privileges, and concessions, including the construction of any and all internal improvements of any and every nature.

To issue shares, stock, debentures, debenture stock, bonds, and other obligations; to subscribe for, to acquire, to invest in, and to hold and control the stocks, shares, bonds, debentures, debenture stock, and securities of any government, national, State, or municipal, and of any canal, railway, or other corporation, private or public, and to exercise all the rights, powers, and privileges of ownership thereof; to vary the investments of the company; to mortgage, pledge, or charge all or any part of the property, concessions, rights, and franchises of this company, acquired and to be acquired; to make advances upon, hold in trust, sell, or dispose of, and otherwise deal with any of the investments or securities aforesaid, or to act as agent for others for any of the above or the like purposes.

In general, to carry on any other business in connection therewith, with all the powers conferred by the aforesaid acts of the legislature of the State of New Jersey and acts amendatory thereof and supplemental thereto.

The corporation shall also have power to conduct its business in all its branches, to have one or more offices, to hold meetings of the directors, to keep its books (except the stock and transfer books), and to hold, purchase, mortgage, lease, and convey real and personal property without the State of New Jersey and in any and all the other States, the Territories, the District of Columbia, and the colonies, dependencies, and possessions of the United States of America, and upon the Isthmus of Panama, and in the United States of Colombia, and in any and all other foreign countries.

The objects in this article specified shall not be limited or restricted by reference to nor inference from the terms of any other article, clause, paragraph, or provision in this certificate contained.

Fourth. The amount of the total authorized capital stock of the corporation is \$30,000,000; the number of shares into which the capital stock is divided is 300,000 shares, consisting of 50,000 shares of first preferred stock, 150,000 shares of second preferred stock, and 100,000 shares of common stock, and the par value of each share is \$100. The amount of capital stock with which it will commence business is \$5,000, consisting of 24 shares of first preferred stock, 9 shares of second preferred stock, and 17 shares of common stock.

From time to time the first preferred stock, the second preferred stock, and the common stock shall be issued in such amounts and proportions as shall be determined by the board of directors and as may be permitted by law.

From time to time the capital stock and each class of the capital stock of the corporation may be increased as permitted by law in such amounts as may be determined by the board of directors and authorized by the holders of two-thirds in amount of each class of the capital stock then issued and outstanding.

The holders of the first preferred stock shall be entitled, out of any and all surplus or net profits, to receive noncumulative dividends whenever the same shall be declared set apart for or paid upon any other stock of the corporation.

In each and every fiscal year for which full dividends shall have set apart for or paid upon all of the first preferred stock, the holders of the second preferred stock shall be entitled, out of any and all surplus or net profits, to receive noncumulative dividends, whenever the same shall be declared by the board of directors, at the rate of but not exceeding 8 per cent per annum for such fiscal year; such dividend to be paid before any dividend for such fiscal year shall be declared, set apart for, or paid upon the common stock.

In addition thereto, in the event of the dissolution or liquidation of the corporation, the holders of the first preferred stock shall be entitled to receive the par value of their preferred shares before anything shall be paid upon the second preferred stock or upon the common stock out of the assets of the corporation; and the holders of the second preferred stock shall be entitled to receive the par value of their preferred shares before anything shall be paid upon the common stock out of the assets of the corporation.

The common stock shall be subject to the prior rights of the first preferred stock and the second preferred stock, as above declared. If, after providing for the payment of full dividends for any fiscal year on the first preferred stock and the second preferred stock, there shall remain any surplus or net profits, such remaining surplus or net profits shall be applicable to the payment of dividends at the rate of 4 per cent per annum upon the common stock whenever the same shall be declared by the board of directors; and out of and to the extent of any such remaining surplus or net profits, after the close of any such fiscal year, the board of directors may pay dividends for such fiscal year at the rate of 4 per cent per annum upon the common stock, but not until after said preferential dividends for such fiscal year upon the first preferred stock and the second preferred stock shall have been actually paid or provided and set apart.

After dividends for any such fiscal year shall have been paid at the rate of 5 per cent upon the first preferred stock and at the rate of 8 per cent per annum upon the second preferred stock, and at the rate of 4 per cent upon the common stock, and any and all other dividends from any remaining net profits which may be declared by the board of directors shall be declared and paid equally in respect of each and every share of the first preferred stock and the common stock of the corporation.

At all meetings of the stockholders of the company the holders of the first preferred stock shall be entitled to one and four-tenths votes (in person or by proxy) for each share of such first preferred stock; and the holders of such second preferred stock and of such common stock shall be entitled to one vote (in person or by proxy) for each share of such second preferred and for each share of such common stock.

With the consent of any holder thereof, any and all of the first preferred stock and any and all of the second preferred stock shall be subject to redemption, and may be redeemed at not less than the par thereof and accrued interest, upon the 1st day of January in any year, at the principal office of the corporation, at Jersey City, N. J. On or before the 1st day of November next preceding such date for redemption, notice of intention so to redeem shall be given as follows: Printed notice addressed to each several record holder of such preferred stock who shall have caused his address to be recorded upon the books of the corporation shall be mailed to him at such address and also shall be published once in each week, for the eight weeks beginning of such 1st day of November, in one newspaper published in the city of New York and in one newspaper published in the city of Paris, which notice shall invite tenders of such preferred stock for retirement.

To provide wholly or in part for such redemption and retirement of such preferred stock, from time to time the corporation, by its board of directors, and in the discretion of the board, may create and may issue common stock in an aggregate amount equal to the amount of such preferred stock so redeemed and retired; and from time to time, upon the redemption and retirement of such preferred stock, certificates may be issued and delivered for corresponding amounts of common stock, which shall be deemed to be, and shall be, full paid and nonassessable if issued either for money or in exchange for a corresponding amount of such preferred stock.

Fifth. The names and post-office addresses of the incorporators and the number of shares subscribed for by each (the aggregate of such subscriptions being the amount of the capital stock with which the company commences business) are as follows:

Name.	Post-office address.	Number of shares.		
		First pre-ferred stock.	Second pre-ferred stock.	Common stock.
William P. Chapman, jr	310 West Forty-fifth street, New York City, N. Y.	8	3	6
Henry W. Clark	329 West Seventy-fourth street, New York City, N. Y.	8	3	6
Francis D. Pollack	Summit, N. J.	8	3	5

Sixth. The duration of the corporation shall be perpetual.

Seventh. The corporation may use and apply its surplus earnings or accumulated profits, authorized to be reserved as a working capital, to the purchase or acquisition of property and to the purchase and acquisition of its own capital stock, from time to time, to such extent and in such manner and upon such terms as its board of directors shall determine; and neither the property nor the capital stock so purchased and acquired, nor any of its capital stock taken in payment or satisfaction of any debt due to the corporation, shall be regarded as profits for the purposes of declaration or payment of dividends, unless otherwise determined by a majority in interest of all the stockholders.

The board of directors, by resolution adopted by a majority of the whole board, may designate five or more directors to constitute an executive committee, which committee, to the extent provided in said resolution or in the by-laws of the corporation, shall have, and may exercise, all the delegable powers of the board of directors in the management of the business affairs of the corporation.

The board of directors, by resolution adopted by a majority of the whole board, may designate a special committee of the board, consisting of directors resident in France; and such special committee shall possess and exercise such powers and perform such duties as may be delegated to it from time to time by the board of directors or by the by-laws of the corporation.

The board of directors, from time to time, shall determine whether and to what extent and at what times and places and under what conditions and regulations the accounts and books of the corporation, or any of them, shall be open to the inspection of the stockholders, and no stockholder shall have any right of inspecting any account or book or document of the corporation, except as conferred by statute or authorized by the board of directors or by a resolution of the stockholders.

The board of directors shall have power to make and to alter by-laws, but without prejudice to the power of the stockholders in general meeting to alter or repeal the same.

The corporation in its by-laws may prescribe the number necessary to constitute a quorum of the board of directors, which number, unless otherwise required by law, may be less than a majority of the whole number.

The board of directors, without any assent or vote of stockholders, shall have power to create, issue, and sell bonds of the corporation, and to authorize and cause to be executed mortgage and liens upon the real property and the personal property, concessions, and franchises of the company (acquired and to be acquired) to secure the payment of the principal and interest of any such bonds, and also to determine the amount of such bond issue or issues, the rate of interest upon such bonds, and the conditions and price of issue, the holders of all the stock of the corporation at any time outstanding hereby expressly consenting to and approving of any and all bonds and mortgages so authorized, but in the event of the acquisition of the canal of the Campagnie Nouvelle du Canal de Panama, there shall be accorded to the shareholders and bondholders of the Campagnie Universelle du Canal Interoceanique de Panama in liquidation a right of preference to subscribe for one-half in amount of such bonds whenever offered for sale.

In witness whereof we have hereunto set our hands and seals the 27th day of December, 1899.

WILLIAM P. CHAPMAN, JR.	[L. S.]
HENRY W. CLARK.	[L. S.]
FRANCIS D. POLLAK.	[L. S.]

Signed, sealed, and delivered in the presence of—

WM. NELSON CROMWELL.
FRANCIS LYNDE STETSON.

STATE OF NEW YORK, *County of New York*, ss:

Be it remembered that on this 27th day of December, 1899, before the undersigned, a duly authorized commissioner of deeds, for the State of New Jersey, in and for the State and county aforesaid, personally appeared William P. Chapman, jr., Henry W. Clark, and Francis D. Pollak, who I am satisfied are the persons named in and who executed the foregoing certificate of incorporation, and I having first made known to them the contents thereof, they did acknowledge that they signed, sealed, and delivered the same as their voluntary act and deed.

In witness whereof I have hereunto set my hand and affixed my official seal as such commissioner for New Jersey on the date aforesaid.

[SEAL.]

CHARLES EDGAR MILLS,
*Commissioner of Deeds for the State of
New Jersey in New York.*

THE INTEROCEANIC CANAL COMPANY.

This is to certify that the undersigned do hereby associate themselves into a corporation under and by virtue of the provisions of an act of the legislature of the State of New Jersey, entitled "An act concerning corporations" (revision of 1896), and the several supplements thereto and acts amendatory thereof, and do severally agree to take the number of shares of capital stock set opposite their respective names:

First. The name of the corporation is the Interoceanic Canal Company.

Second. The location of its principal office in the State of New Jersey is at No. 83 Montgomery street, in the city of Jersey City, county of Hudson. Said office is to be registered with the New Jersey Title Guarantee and Trust Company. The name of the agent therein and in charge thereof, upon whom process against this corporation may be served, is "The New Jersey Title Guarantee and Title Company."

Third. The objects for which this corporation is formed are:

To survey, locate, excavate, construct, enlarge, extend, use, maintain, own, and operate a maritime canal and its accessories between the Atlantic and Pacific oceans, through the territory of Nicaragua, or any other territory in Central or South America.

To acquire the concessions granted, or heretofore granted, by any government for the construction and operation of a maritime canal and its accessories between the Atlantic and Pacific oceans in Central or South America; and the corporation shall have all the rights, prerogatives, and powers necessary to fulfill the duties and obligations imposed, and to enjoy the privileges conferred upon it by such concessions; and the corporation shall have the power to formulate rules and regulations for the construction, management, care, protection, improvement, use, and operation of the canal and its accessories and appurtenances, and for the collection of its tolls, and may modify such rules and regulations at its discretion.

To survey, locate, construct, purchase, lease, maintain, own, and operate roads, railways with any motive power for the carriage of passengers and freight, navigation lines by boats or steamers, and any other means of transportation, and telegraph, cable, and telephone lines in such place or places as the company may deem necessary or convenient for the construction and surveys of the canal and its appurtenances and for the more advantageous maintenance and operation thereof.

To acquire, hold, deal with, and dispose of as to the company may seem proper all spaces of lands and waters that may be necessary or convenient for the construction, extension, enlargement, maintenance, repair, protection, use, and enjoyment of the canal and its accessories, including all spaces required for the deposit of materials from excavations and cuttings for the overflow arising from lakes, lagoons, and streams, and from dams in rivers, and from all deflections and rectifications of streams, and for ports and extensions thereof, and for docks, dikes, piers, basins, sluices, weirs, locks, guard gates, reservoirs, embankments, walls, and drainage and discharge channels, for lights, light-houses, beacons, buildings, storehouses, machine shops, hospitals, shipyards, deposits of coal, wood, and materials, and including all lands traversed or submerged by overflow or by surplus waters, and for whatever purpose may be necessary or convenient; also to acquire, hold, colonize, deal with, and dispose of all lands and rights in land and real property which it may from time to time acquire.

To levy and collect transit, navigation, tonnage, light, light-house, anchorage, and port dues, towage, lighterage, storage, wharfage, pilotage, hospital, quarantine, and all other similar charges, from

steamers, ships, vessels, and boats of all kinds, and from passengers, merchandise, and cargo of all kinds, for which purpose the corporation may at its pleasure establish and modify its tariffs.

To have and exercise all the rights and privileges enjoyed by mining enterprises, lumber companies, manufacturing companies of all kinds, importing and exporting companies, and in general all mercantile companies; and also to have and exercise all the rights and privileges enjoyed by enterprises which have for their object the establishment of shipyards, dry docks, warehouse business, the purchase, storage, and sale of coal, the organization of express companies, agricultural pursuits, and fishing.

To buy and sell and otherwise deal in real estate.

To operate hotels and boarding houses, and hospitals, and stores for the sale of provisions, clothing, and every kind of merchandise.

To supply water from the canal and its appurtenances to persons, firms, or corporations that may desire it for irrigation, supply of towns, motive power, or for any other purpose, and to fix and collect dues for these services.

To establish in countries foreign to the United States, and in accordance with terms of concessions granted by the governments of such countries, a police force duly organized for the protection of life and property and preservation of order along the route of the canal.

To survey, locate, construct, purchase, lease, maintain, own, and operate railways, telegraph, cable, and telephone lines, roads, and lines of navigation by boats or steamers, and other means of transportation anywhere outside the State of New Jersey.

To purchase, hold, sell, assign, transfer, mortgage, pledge, or otherwise dispose of the shares of the capital stock or any bonds, securities, or evidences of indebtedness created by any other corporations of the State of New Jersey or of any other State or foreign country, and while owner of said stock to exercise all the rights, powers, and privileges of ownership, including the right to vote thereon.

To build, construct, and repair railroads, water, gas, or electric works, tunnels, bridges, viaducts, canals, hotels, wharves, piers, and any like works of internal improvement or public use or utility outside the State of New Jersey.

To make and enter into contracts of every sort and kind with any individual, firm, association, corporation, private, public, or municipal, body politic, or with any government, national, State, Territorial, or colonial.

The corporation shall have power to conduct its business in all its branches in any State or country, or have one or more offices, and unlimitedly to hold, purchase, mortgage, and convey real and personal property in the State of New Jersey and in all other States and in all foreign countries.

Fourth. The total authorized capital stock of this corporation is \$100,000,000, divided into 1,000,000 shares of the par value of \$100 each.

Fifth. The names and post-office addresses of the incorporators and the number of shares subscribed for by each, the aggregate of

such subscriptions being the amount of capital stock with which the company will commence business, are as follows:

Name.	Post-office address.	Number shares.
William B. Crowell	Jersey City, N. J.	10
Levi B. Gilchrist	do.	10
James M. V. Rooney	do.	10
James J. Traynor	do.	10
George W. Bell	do.	10
Charles B. Cadley	do.	10
Richard D. Purcell	do.	10

Sixth. The board of directors may by resolution provide that any government, upon becoming and while continuing to be a stockholder in this corporation, may have the right of naming one or more members of the board of directors of the corporation, which director or directors shall have all the rights, privileges, and powers conferred upon any director by this certificate of incorporation by the laws of the State of New Jersey or by the by-laws of this corporation. The board of directors shall have power, without the assent or vote of the stockholders, to make, alter, amend, and repeal by-laws for the corporation, but the by-laws shall always provide for notice of the objects of any special meeting of stockholders, and the by-laws shall require an annual meeting of the stockholders to be held at the principal office of the corporation in the State of New Jersey on the first Tuesday of May in each and every year at 12 o'clock noon, and no change in the time of holding the said annual meeting of the stockholders shall be made except by amendment made to said by-laws by the stockholders at any one of such annual meetings or at a special meeting called for such purpose upon notice to the stockholders at least fifteen days before day fixed by such by-laws for such a meeting.

The directors shall have power to fix the amount to be reserved as working capital, to authorize and cause to be executed to any amount bonds or other obligations of the corporations and mortgages and liens upon the property of the corporation, or any part thereof, and whether then owned or afterwards acquired, and from time to time to sell, assign, transfer, or otherwise dispose of any or all of its property; but no sale of all of its property shall be made except upon the vote of the holders of a majority of the stock. The board of directors from time to time shall determine whether and to what extent and at what time and places and under what conditions and regulations the accounts and books of the corporation or any of them shall be opened to the inspection of the stockholders, and no stockholder shall have any right of inspecting any account, or book, or document of the corporation except as conferred by statute or authorized by the board of directors or by a resolution of the stockholders.

The directors shall have power to hold their meetings, to have one or more offices, and to keep the books of the corporation (except the stock and transfer of books) outside of the State of New Jersey and at such places as may from time to time be designated by them.

The number of directors of this corporation upon its organization shall be five, but thereafter the directors can increase or diminish the number by power of the provisions contained in the by-laws.

The directors shall be divided as equally as may be into three classes. The seats of directors of the first class shall be vacated at the expiration of the first year, of the second class at the expiration of the second year, and of the third class at the expiration of the third year; so that one-third may be chosen every year.

The board of directors, by resolution passed by a majority of the whole board, may designate three or more directors to constitute an executive committee, to the extent provided in said resolution or in the by-laws of the corporation shall have and may exercise the power of the board of directors in the management of the business and affairs of the corporation, and shall have power to authorize the seal of the corporation to be affixed to all papers which may require it.

The board of directors may in like manner designate one of their number to be a managing director, who may possess and exercise all such of the powers of the corporation as may be conferred upon him by the said board by resolution or by the by-laws of the company.

Seventh. The period of existence of this corporation is to be perpetual.

In witness whereof we have hereunto set our hands and seals this 31st day of March, A. D. 1900,

WILLIAM B. CROWELL.	[L. S.]
LEVI B. GILCHREST.	[L. S.]
JAMES M. V. ROONEY.	[L. S.]
JAMES J. TRAYNOR.	[L. S.]
GEORGE W. BELL.	[L. S.]
CHARLES P. CADLEY.	[L. S.]
R. D. PURCELL.	[L. S.]

Signed, sealed, and delivered in the presence of—
JOSEPH GARRISON.

STATE OF NEW YORK, .

City and County of New York, ss:

Be it remembered that on the 21st day of March, A. D. 1900, before me, a master in chancery of New Jersey, personally appeared William B. Crowell, Levi B. Gilchrest, James M. V. Rooney, James J. Traynor, George W. Bell, Charles P. Cadley, Richard D. Purcell, who I am satisfied are the persons named in and who executed the foregoing certificate, and I having first made known to them the contents thereof, they did each acknowledge that they signed, sealed, and delivered the same as their voluntary act and deed.

JOSEPH GARRISON,
Master in Chancery of New Jersey.

Senator MORGAN. Was that the same broad, philanthropic or patriotic sentiment that caused you to take out that charter?

Mr. CROMWELL. Senator, I have declined to answer so often that I think I had better get a phonograph to repeat it to you.

Senator MORGAN. If you will be good enough to remember that you are under oath, and a witness—

Mr. CROMWELL. I remember both, sir.

Senator MORGAN (continuing). And answer the questions, we will get along better.

Mr. CROMWELL. I remember both, sir; and I repeat the answer again.

Senator MORGAN. What is the answer?

Mr. CROMWELL. That I decline to answer, on the ground that it is a privileged communication.

Senator MORGAN. Why was it privileged?

Mr. CROMWELL. That is my answer, sir.

Senator MORGAN. Why was it privileged? State how and why.

Mr. CROMWELL. I have already answered, sir, and I shall answer no further.

Senator MORGAN. You have not answered that question. It has never been put to you before.

How and why is that a privileged matter or question?

Mr. CROMWELL. Because it arises in the course of my employment as general counsel of the New Panama Canal Company.

Senator MORGAN. And you refuse, therefore, to acknowledge or to state anything about your being a subscribing witness to that incorporation charter, which is printed in the laws of New Jersey?

Mr. CROMWELL. I decline, for the same reason.

Senator MORGAN. Well, I will put the act in the record.

Mr. Chairman, I will suggest that several of us want to go to the Senate; I know I do; it is 12 o'clock, and I will continue the examination after we reassemble. I have had to miss a meeting of the Committee on Foreign Relations this morning, in order to attend the meeting of this committee.

Senator KITTREDGE. Can we not proceed until 1 o'clock with this hearing?

Senator MORGAN. I want to go into the Senate, Mr. Senator.

The CHAIRMAN. I think it is very desirable to continue until 1 o'clock.

Senator MORGAN. I have important business in the Senate. I am obliged to go.

The CHAIRMAN. Senator Morgan, I think most of the Senators wish to have no session this afternoon. If we stop now, we will probably have no session until to-morrow.

Senator MORGAN. I shall not feel in anywise grieved about that. I would like to rest a little bit.

Senator TALIAFERRO. There is no objection to our going right along with this monetary affair?

The CHAIRMAN. I think we had better continue. Will you proceed, then, Senator Taliaferro?

Senator MORGAN. Will there be a meeting of the committee this afternoon?

The CHAIRMAN. I think not this afternoon; not until to-morrow morning.

Senator MORGAN. Is that understood all around the table?

The CHAIRMAN. Yes; we will reconvene at 10.30 o'clock to-morrow morning.

Senator TALIAFERRO. Mr. Cromwell, Article II of that agreement—

Senator KITTREDGE. You refer to the monetary agreement?

Senator TALIAFERRO. Yes. Article II of that agreement provides that "The Commission, the railroad company, and the Republic, severally, but not jointly, agree with each other and with the bankers severally to purchase from or sell to the bankers, as the case may be, in the proportions aforesaid, all drafts or bills of exchange drawn on the Isthmus upon any party in the United States

which they may desire to purchase or sell for any purpose soever, upon the terms and conditions herein agreed."

Have you that article before you?

Mr. CROMWELL. Yes, sir; I have that before me, Senator.

Senator TALIAFERRO. Does not that distinctly say that all drafts drawn on the Isthmus are sold to the subscribers to that agreement?

Mr. CROMWELL. Yes, sir; upon the terms and conditions agreed.

Senator TALIAFERRO. Yes; upon the terms and conditions agreed.

Mr. CROMWELL. Yes, sir. Those are the preceding ones.

Senator TALIAFERRO. Your impression is that if a subtreasury draft is drawn there and the representatives of this Government on the Isthmus are willing to take Panaman silver for it, that it costs this Government no exchange on the draft?

Mr. CROMWELL. That is my understanding, Senator. I will verify it this afternoon.

Senator TALIAFERRO. I should be glad to have you do so.

Mr. CROMWELL. I shall make a point of it. That is my understanding, and the language of the paper is so.

Senator TALIAFERRO. I notice in the testimony of Governor Ma-
goon before this committee on February 12, in answer to a question that I asked him, he practically states that the Government pays this three-quarters of 1 per cent where they get United States currency. I notice his statement to that effect.

Mr. CROMWELL. Yes, sir.

Senator TALIAFERRO. That would seem to bear out your statement as to the operations of the agreement?

Mr. CROMWELL. Yes, sir.

Senator TALIAFERRO. But if that were so, what object would there be to the bank to handle that paper?

Mr. CROMWELL. Senator, that is just where we made the best of the bargain.

Senator TALIAFERRO. That is the advantage to this country?

Mr. CROMWELL. Yes, sir. That is just where we made the best of the bargain. We insisted that the bankers should furnish us all the silver that the United States might want, without limit, provided only that ten days' notice be given, at exactly two for one, without any of that premium. And the bankers go further than that—they do not get their money back until ten days afterwards. They take the piece of paper called a "draft" on the New York Subtreasury, and count this silver out over the counter, directly to the United States officer, who takes it to pay your laborers; and they take the piece of paper and send it to New York for collection, and it takes them ten days or two weeks before they get the money back.

Senator TALIAFERRO. You will ascertain accurately about that, so that you can make a statement positively to the committee at our next meeting?

Mr. CROMWELL. I will, Senator. I observe that the testimony is obscure upon that point. I was surprised that there was any obscurity. I imagine that it is possibly because no one who has testified has had any practical duty in the actual administration of it.

Senator TALIAFERRO. I understood you to say that you drew this agreement?

Mr. CROMWELL. I drew the first draft of it. It was then submitted to the Secretary of War, revised by him, and submitted to General

Hubbard, the president of the International Banking Corporation, the fourth party to the agreement, and in the attrition of mind and discussion there finally was evolved this particular form. I may state, too, that there is a feature of it that is extremely important to us, and which was a difficulty that paralyzed us all—namely, that these bankers refused for weeks to make any agreement unless the United States would guarantee a fixed commission, a fixed benefit. You observe that there is a necessity for the bankers to deliver silver. They take an illimitable obligation. There is no limit to the amount that may be demanded of them, only that ten days' notice is required, and yet they must store up this silver which is not easy to get. You can not go out and buy it, as you would any other commodity. It only comes in—percolates into their establishments in connection with their current business, and sometimes they have to store up this silver physically there and hold it for weeks to be ready for the instant the United States demands it.

Bear in mind that these are not banks in the ordinary way. Bear in mind that upon the Isthmus there is no such thing as an ordinary bank of deposit. Bear in mind that silver there is held in a vault, physically. There are no such things as checks and current business in commercial affairs as we have them here, and for a century it has been so, never otherwise. Thus we meet a peculiar condition, so that with all the money in the world, Senator, you could not go out to-day and buy \$500,000 worth, or even, probably, a hundred thousand dollars of silver in Panama. You could not get it. The silver goes out through all the arteries of business, and out into the country, and is stored away in their stockings and what not, and it only comes back to the few merchants, the important merchants who trade. It comes back to them in payment for the merchandise, the various things that are sold. Largely that statement is true. Therefore it centers in these particular channels, and you can not get it in any other way. You can not go out and buy it, as you would buy New York money. You can not go out as you would in Washington to any bank and get money. No. It is stored in a vault and physically carried there piece by piece.

Senator TALIAFERRO. Mr. Cromwell, had you concluded?

Mr. CROMWELL. I was just explaining. Perhaps all that is unnecessary. I was just explaining, because I thought it might be interesting to you.

Senator TALIAFERRO. It is interesting.

Mr. CROMWELL. It is a unique condition. Senator Ankeny, as he has said, knows the condition in China. These things are peculiar to a locality. In China, of course, you have a larger field.

Senator ANKENY. In China the Mexican dollars are all chopped, and the money goes by dead weight and is valued just as is a piece of lead, or opium, or anything of that kind.

In the purchase of this silver the Panama Government, for instance, buys it at 46½, say, and the premium runs to that. The silver they buy on the open market?

Mr. CROMWELL. Yes, sir.

Senator ANKENY. To make the pesos of?

Mr. CROMWELL. Yes, sir.

Senator ANKENY. They buy on the market the bar silver to make these pesos out of?

Mr. CROMWELL. Yes, sir.

Senator ANKENY. And they buy it at 46½ or 48 or maybe 51, for aught I know, and that premium is theirs?

Mr. CROMWELL. It did not become theirs, because they deposited the difference—practically the difference——

Senator ANKENY. That is what I am getting at.

Mr. CROMWELL. In the reserve fund.

Senator ANKENY. I wanted to know what became of that difference.

Mr. CROMWELL. That difference was approximated at 15 per cent of the face of the piece of silver, and that difference of 15 per cent was deposited and is now on deposit with the Bankers' Trust Company, of New York, as the gold-reserve fund.

Senator ANKENY. It goes into the reserve fund?

Mr. CROMWELL. Yes, sir.

Senator ANKENY. And they are not really benefited if they buy the bar silver at a discount?

Mr. CROMWELL. No, sir; there was practically no difference. The difference they otherwise would have had the benefit of they have lost by the deposit of that sum of money in New York as a gold-reserve fund.

Senator ANKENY. We are a little selfish in this matter, and if our Government saw the necessity—I do not admit that they do—of making that peso dollar down there, why not make a chop dollar, as the Chinaman calls it? They have a little scale and chop the money to get the value of it. The Mexican dollar is the currency in China, you know.

Mr. CROMWELL. Yes, sir.

Senator ANKENY. Only looking at our own interests, if there is a premium in the thing, why not have our Government buy the silver and, if necessary, make a peso dollar, or some dollar that will circulate there?

Mr. CROMWELL. Of the same denomination as the Panama coinage? There could be no practical objection, to my mind.

Senator ANKENY. That is, the way we buy our own silver.

Mr. CROMWELL. There would be no practical objection if the United States should coin a piece of silver of the same general dimensions and weight as the Panama coin.

Senator ANKENY. And then chop it?

Mr. CROMWELL. Yes. That would circulate, I have no doubt, on a parity.

Senator ANKENY. It would circulate in Panama and not elsewhere; on the Zone, but not elsewhere?

Mr. CROMWELL. Yes, sir; it would be special to the Republic of Panama.

Senator ANKENY. Would not that be entirely logical?

Mr. CROMWELL. I think it would be practicable.

Senator TALIAFERRO. It would not be satisfactory to the Panaman Government, would it?

Senator ANKENY. Why not? They get the same weight.

Mr. CROMWELL. I do not think the Panama Government would have any objection to it. The contract expires in April. It was only for one year, and it was meant to be experimental in character.

Senator ANKENY. We are only figuring on our own interest in the matter.

Mr. CROMWELL. Yes, sir; that is the way I figure, Senator.

Senator ANKENY. In that event, whatever premium there was would inure to our benefit.

Mr. CROMWELL. There would be what you call seigniorage.

Senator ANKENY. I am just talking of our own arrangement.

Mr. CROMWELL. You have large seigniorage here. In the case of the Panama Government they do not get the seigniorage.

Senator ANKENY. That would be practicable and logical, you think?

Mr. CROMWELL. I think it would be practicable.

Senator ANKENY. And it would be the logical thing to do?

Mr. CROMWELL. It is a logical thing to do. My opinion may not be of any value—

Senator ANKENY. I ask you as an expert. You know about it.

Mr. CROMWELL. My impression is that one coinage is the wisest.

Senator ANKENY. The evidence which has been given shows that many do not clearly understand it.

Mr. CROMWELL. You are absolutely correct. I read the testimony upon that point with wonderment. There is a great confusion about it, and I shall be glad to make the subject clear for you if I can.

Senator TALIAFERRO. Do you sustain any official relations to the Isthmian Canal Commission?

Mr. CROMWELL. No, sir.

Senator TALIAFERRO. None whatever?

Mr. CROMWELL. Never. I never have.

Senator TALIAFERRO. You are merely an attorney and a member of the board of directors of the railroad company?

Mr. CROMWELL. Yes, sir.

Senator TALIAFERRO. I think you testified yesterday that your compensation for that service was \$6,500 a year?

Mr. CROMWELL. Six thousand dollars a year my firm are paid for their general services, for general work of all kinds. Personally I attend to very little of it. My partners do the most of it.

Senator TALIAFERRO. You spoke a moment ago about the desire in making this monetary arrangement to arrange things as conveniently and as satisfactorily as possible with the laboring classes on the canal?

Mr. CROMWELL. Yes, sir.

Senator TALIAFERRO. And as much in the interests of this Government as possible?

Mr. CROMWELL. Absolutely.

Senator TALIAFERRO. You felt sure that there was nothing there that would interfere with your duties to the Panaman Government?

Mr. CROMWELL. The duties to them were nominal.

Senator TALIAFERRO. In this arrangement, and in your thought for those laboring people down there, why did you not provide for them to purchase New York exchange on as favorable terms as you provide for the United States Government to purchase it?

Mr. CROMWELL. That would deprive the agreement, Senator, of course, of any benefit whatever to the bankers. No banker would sign an agreement in which there was not some prospect of profit, small as it might be.

Senator TALIAFERRO. You were under the impression that the bankers did sign an agreement that was not only of no profit to them, but a positive loss, in that you say they agreed to cash our drafts down there on New York without charge, where you took the Panaman silver, and it required them several days to get the money from that draft.

Mr. CROMWELL. That is true.

Senator TALIAFERRO. That is a loss to them?

Mr. CROMWELL. That part of the agreement should operate to them as a loss, but the profit to them probably lies in the rest of the agreement. That is probably where their profit lies, from the public buying drafts at a premium of $1\frac{1}{2}$ per cent. That is a very small premium, by the way, as compared with the premium of 270 down to 225 that formerly prevailed. Now it is only 201 $\frac{1}{2}$. I say that therein, Senator, lies the profit, probably, that induced them to make the agreement.

I may say to you that the bankers have expressed extreme dissatisfaction with the agreement, and it is by no means certain that you can get it renewed.

Senator DRYDEN. Was not this an advantage to the bankers in that it gave stability to the rate of the silver?

Mr. CROMWELL. That is the point.

Senator DRYDEN. And that the banker, therefore, knew all the time "where he was at," so to speak; he had solid ground under him, instead of a marsh and quagmire into which he might sink at any moment?

Mr. CROMWELL. You are right, Senator. I want to say a word in justice to these gentlemen of the Isthmus, whom I met for the first time, practically, in this connection. I appealed to all their sentiments to maintain the stability of commerce, to get away from those horrid fluctuations that have scandalized the South American Republics. I claim some credit for urging first upon President Amador that he put his Government upon the gold basis. I urged that, and devised the suggestion of having a reserve fund of 15 per cent in New York. I have tried to do all that I could to bring up the national honor of that nation, and when we appealed to these bankers who have so many interests (as Senator Dryden has indicated the other commercial interests that they have) to secure stability in the financial affairs of the country, I say that they took a broad and generous view of the matter and desired to produce stability of trade and of values.

Senator SIMMONS. I want to ask one more question. As I see this, Mr. Cromwell, it seems to me that the benefits of this transaction to the bankers, as you call them, are as great as to the Government of the United States. It seems to me that it was a necessary arrangement for them. As I understand you, you say that these are not banks proper, but they are mercantile establishments?

Mr. CROMWELL. Yes, sir.

Senator SIMMONS. They are the great merchants of the Isthmus?

Mr. CROMWELL. That is it.

Senator SIMMONS. They sell their products on the Isthmus, and they buy them elsewhere, do they not?

Mr. CROMWELL. Yes, sir.

Senator SIMMONS. In selling them they gather in this silver?

Mr. CROMWELL. Yes, sir.

Senator SIMMONS. Then they have got to get that silver back in circulation again or they can not continue to sell?

Mr. CROMWELL. Yes, sir.

Senator SIMMONS. The Government enables them to put this silver back in circulation, does it not?

Mr. CROMWELL. Yes, sir.

Senator SIMMONS. Does not the Government, at the same time that it enables them to put the silver back in circulation, furnish them with money current throughout the world with which to pay for the things which they buy in turn to sell?

Mr. CROMWELL. Undoubtedly, Senator.

Senator SIMMONS. Is not the arrangement just as beneficial to them as it is to us, and is it not an absolutely essential arrangement upon the Isthmus and under the conditions that exist there in order to carry on their business?

Mr. CROMWELL. I have argued not as ably, but somewhat to the purport that you have indicated. So did I argue with gentlemen, to urge them to make these low figures, to sell the exchange to the public at $1\frac{1}{2}$ per cent premium only in gold—a thing that never had been done—and, in fact, gentlemen, it has worked even better than that, for they have hardly ever gone up to even $1\frac{1}{2}$ per cent.

Senator TALIAFERRO. Why did you suggest $1\frac{1}{2}$?

Mr. CROMWELL. That was suggested as the limit, to compel them not to sell higher.

Senator TALIAFERRO. Is there any such agreement in existence?

Mr. CROMWELL. This is the agreement.

Senator TALIAFERRO. This agreement allows 3.

Mr. CROMWELL. No, sir; 3 cents in silver, not in gold. Three cents silver is only $1\frac{1}{2}$ cents gold. Permit me to say that I have observed that blunder two or three times in the testimony here.

Senator TALIAFERRO. Governor Magoon testified—

Mr. CROMWELL. He did so testify, and he made an error, and told me so, a day or two ago. It is an error. Here is the agreement. It provides for 3 cents in silver, not in gold; $1\frac{1}{2}$ cents gold.

Senator SIMMONS. They can not pay for their foreign purchases with Panaman silver?

Mr. CROMWELL. No, sir; they have to draw exchange.

Senator SIMMONS. The Government of the United States furnishes them the exchange with which to pay for their foreign purchases?

Mr. CROMWELL. I have urged that, and I say that undoubtedly; and were it not for the peculiar and fortunate fact that you have so well put—and I could not put it as well—were it not for those reasons, we could not get these low rates for the Government. What you allude to does not cost the United States anything, but it is an inducement to them to make us low rates. That does not cost the United States anything. We get the benefit of that inducement.

Senator TALIAFERRO. I am not asking so much about the arrangement as to the United States. I am talking about these employees down there, for whom you expressed solicitude a few moments ago.

Mr. CROMWELL. Yes, sir.

Senator TALIAFERRO. I want to know if, in the preparation of this

arrangement, you knew or realized that you were depriving this Government of the right to issue its drafts to its employees for what it might owe them, and that they might desire to send to this country for their families?

Mr. CROMWELL. Yes, sir.

Senator TALIAFERRO. You were aware of it?

Mr. CROMWELL. Deliberately; yes, sir.

Senator TALIAFERRO. And you were aware that you were authorizing the banks to charge them for such exchange as that, needed to send their earnings home for their families, twice as much as they charge the United States Government for the same service, or practically twice as much?

Mr. CROMWELL. They did not charge the United States anything for the service.

Senator TALIAFERRO. They did for the United States currency, by your statement.

Mr. CROMWELL. Oh, yes, sir; that is right, sir.

Senator TALIAFERRO. You were aware of that?

Mr. CROMWELL. Yes, sir.

Senator TALIAFERRO. Did you attempt, in making this arrangement with the banks down there, to hedge that point or correct it in any way in the interests of the laborers?

Mr. CROMWELL. I consider—and I am only speaking for myself—that it was highly to the interests of the laborers, first in bringing the rate down from the altitude of 225 to 1½. In the second place, we know that very little money of the laborer comes home to the United States at all. Most of it is spent on the Isthmus for his living, and naturally necessarily so; and the theory that there are vast sums of money sent home to the families is a fiction. And, again, all these laborers, for whom we all have a just and manly solicitude—

Senator TALIAFERRO. You are setting up a man to knock him down when you refer to the theory that there is a vast sum of money sent home to their families, because nobody has taken that position in this examination; nobody has testified to it; nobody has stated it that I know of.

Senator SIMMONS. I do not understand you on this point at all, Mr. Cromwell. I understand that if the Government wanted to get the United States money from these banks the Government has to pay a commission?

Mr. CROMWELL. For United States money; yes, sir.

Senator SIMMONS. If an employee wants United States money he has to pay?

Mr. CROMWELL. Yes, sir.

Senator SIMMONS. If the Government, instead of buying the silver over there, should want to buy a draft on the United States, the Government would have to pay a commission on that, would it not?

Senator TALIAFERRO. Undoubtedly it would.

Mr. CROMWELL. Yes, sir.

Senator SIMMONS. That is all that a laborer has to do, is it not? He has to buy a draft?

Mr. CROMWELL. Exactly the same as any individual would.

Senator TALIAFERRO. Not the same as any individual; you do not mean that?

Mr. CROMWELL. Does he not?

Senator TALIAFERRO. He does not pay the same as the United States Government?

Mr. CROMWELL. I mean, except the United States Government.

Senator TALIAFERRO. We are discussing the United States.

Senator SIMMONS. I am trying to get at that point. I understood that if the United States Government sold them a draft it did not pay, but got in exchange Panaman money; but if the United States Government buys a draft, then does not the Government have to pay for it?

Mr. CROMWELL. Yes, sir; it does.

Senator SIMMONS. And if the laborer buys a draft, he has to pay for it?

Mr. CROMWELL. Yes, sir.

Senator SIMMONS. That puts the Government and the laborer on the same footing, does it not?

Mr. CROMWELL. With this distinction, that the Government gets its draft at a uniform rate of three-quarters of 1 per cent premium.

Senator TALIAFERRO. One per cent.

Mr. CROMWELL. No; three-quarters of 1 per cent.

Senator TALIAFERRO. One per cent.

Mr. CROMWELL. Three-quarters of 1 per cent premium.

Senator TALIAFERRO. They pay 1 per cent for exchange.

Mr. CROMWELL. One per cent for exchange, yes; and the laborer will buy his draft—

Senator TALIAFERRO. At 3 per cent.

Mr. CROMWELL. At whatever is the ruling rate of the day, which can not exceed $1\frac{1}{2}$ per cent.

Senator TALIAFERRO. Three per cent, as compared with the Government's 1 per cent.

Senator SIMMONS. There is a difference in the price paid. That is the difference?

Senator DRYDEN. Does the Government in its operations have occasion to buy drafts on the United States?

Mr. CROMWELL. I think never. That is the provision that I think is not operative.

Senator DRYDEN. I do not understand why the United States Government should ever in practice have occasion to buy a draft on the United States.

Mr. CROMWELL. That is the provision which I believe I said had no practical operation.

Senator DRYDEN. Then that provision amounts to nothing?

Mr. CROMWELL. I think it amounts to nothing.

Senator SIMMONS. What I wanted to know was, when the Government buys a draft—not when it sells, but when it buys a draft—what commission does it pay?

Mr. CROMWELL. When it buys a draft it pays 1 per cent.

Senator SIMMONS. When a laborer buys a draft, what commission does he pay?

Mr. CROMWELL. He pays the rate of the day, which can not exceed $1\frac{1}{2}$ per cent gold.

Senator SIMMONS. In other words, there is no agreement as to what the laborer shall pay?

Mr. CROMWELL. There is no fixed agreement, but it can not exceed $1\frac{1}{2}$ per cent. We fixed the maximum; we have established the maximum, and in practice it is about par.

May I inquire, Senator Taliaferro, whether I have answered your questions as fully as you desire?

Senator TALIAFERRO. The examination has taken such a general turn that I do not know whether we have gotten at the facts or not as I wished.

Mr. CROMWELL. Would you like me to look it up over night?

Senator TALIAFERRO. You said that you would get that statement from the Commission as to what was the operation of this agreement in the matter of silver.

Mr. CROMWELL. I will.

Senator TALIAFERRO. The fact is that under this agreement the subscribing bankers on the Isthmus have the right to charge for American exchange furnished to any of the Commission's laborers on the Isthmus 3 cents.

Mr. CROMWELL. Three cents Panama silver, equivalent to $1\frac{1}{2}$ cents gold.

Senator TALIAFERRO. As against 2 cents silver?

Mr. CROMWELL. Two cents Panama silver or 1 cent American gold.

Senator TALIAFERRO (continuing). For exchange bought by the Government?

Mr. CROMWELL. Yes, sir; for exchange bought by the Government.

Senator TALIAFERRO. That is the fact?

Mr. CROMWELL. That is the fact, Senator; and I beg to remind you that the rate of $1\frac{1}{2}$ per cent charged to the public is the maximum rate and not necessarily the fixed rate, and that in practice it may fall below that and be equal to that furnished to the Government. In practice I am told that the bankers' rate has been nearer the Government rate than above it through almost the entire period of this agreement.

Senator TALIAFERRO. There is no elasticity whatever to the Government rate?

Mr. CROMWELL. No, sir; that is fixed.

Senator TALIAFERRO. That is fixed?

Mr. CROMWELL. That is fixed. There is elasticity to the public rate, and in view of the effectiveness of this agreement, the stability which it has created, the character and dignity which has thus been given to the currency of the Isthmus, it has transpired that the current rate of exchange to the laborers—the public—has been—

Senator TALIAFERRO. Differentiate those two classes; do not put in the public. There is nothing in this agreement as to the public.

Mr. CROMWELL. I beg your pardon, sir; there is.

Senator TALIAFERRO. I beg your pardon; I did not see it. I beg your pardon if there is anything about it in the agreement.

Mr. CROMWELL. I know that you want to be accurate. That is the only reason I make the correction. It is under "D," Senator, which reads as follows:

"The bankers also severally agree to sell to the public—that is, to whomsoever may call for and request the same at their respective banking offices in Panama, and who may at the same time tender therefor payment in silver currency of Panama—drafts or bills of exchange on New York drawn by them, respectively, at not more

than three days' sight, at a rate which shall not exceed 2 silver pesos and 3 cents Panama currency for each \$1 United States currency; and they also likewise agree not to sell any drafts or bills of exchange on New York to any other parties at the rates or upon terms or compensation which shall in any instance exceed 2 silver pesos and 3 cents Panama currency for each \$1 United States currency."

Senator DRYDEN. Did competition between these banking and mercantile houses play any part in bringing about this arrangement; and if so, what?

Mr. CROMWELL. It did. They were bitter competitors. That was one of the great difficulties that we had in making that arrangement. You will observe a feature of this agreement which is unique. It provides that in case any one of the bankers fails to fulfill the demand of the Government, the other banker is bound to fulfill and pay and deliver the whole amount required. Each man thus stands as sponsor for the whole, and if they all of them fail, then the agreement can be terminated by the Government. There was the point of difficulty, to have these four competitors, vigorous competitors, lifelong competitors, come to an accord in this agreement. I say, in all modesty, that that was quite an achievement.

Senator DRYDEN. The resources of every institution and house, then, concerned in this agreement are pledged not only for the fulfillment of its own proportionate part, but for the entire part?

Mr. CROMWELL. Yes, sir; for the entire part, and in case either party is unable to deliver his quota as demanded, then the one who does not announce his inability is compelled to stand for the whole. And, gentlemen, that predicament has happened so often that it has taken every ounce of influence that we possess to hold this agreement together. There have been protests after protests by several of these bankers against being landed with the whole obligation to deliver the silver. And it has happened many a time since this paper was signed that one or two of the parties have been unable to deliver their quota, and the others have been compelled to deliver the whole amount.

Senator TALIAFERRO. To make it up?

Mr. CROMWELL. Yes, sir. That is what makes this so onerous.

Senator TALIAFERRO. There seems to be still some confusion about that rate of exchange.

Mr. CROMWELL. Yes, sir.

Senator TALIAFERRO. This paragraph "D," to which you have referred, states that: "The bankers also severally agree to sell to the public;" in that you are correct. I had overlooked that.

Mr. CROMWELL. Oh, that is a mere question of memory, Senator.

Senator TALIAFERRO. This paragraph "D" reads:

"The bankers also severally agree to sell to the public—that is, to whomsoever may call for and request the same at their respective banking offices in Panama, and who may at the same time tender therefor payment in silver currency of Panama—drafts or bills of exchange on New York drawn by them, respectively, at not more than three days' sight, at a rate which shall not exceed 2 silver pesos and 3 cents Panama currency for each \$1 United States currency; and they also likewise agree not to sell any drafts or bills of exchange on New York to any other parties at rates or upon terms

or compensation which shall in any instance exceed 2 silver pesos and 3 cents Panama currency for each \$1 United States currency."

Mr. CROMWELL. Yes, sir.

Senator TALIAFERRO. You stated a moment ago, as I understand, that the rate of exchange was 3 cents Panaman silver.

Mr. CROMWELL. It is.

Senator TALIAFERRO. That says at a rate which shall not exceed "2 silver pesos and 3 cents Panama currency."

Mr. CROMWELL. Yes.

Senator TALIAFERRO. What is 2 silver pesos?

Mr. CROMWELL. To silver pesos equal \$1 gold. A peso is 50 cents, you see.

Senator TALIAFERRO. And 3 cents Panama currency?

Mr. CROMWELL. That is $1\frac{1}{2}$ cents gold.

Senator TALIAFERRO. That would make the rate $2\frac{1}{2}$ cents, would it not, instead of $1\frac{1}{2}$ cents, as you said a moment ago? It is right before you there. Just reflect upon it a moment.

Mr. CROMWELL. It makes it 203 Panama silver for each one dollar United States currency.

Senator TALIAFERRO. Two silver pesos, you say, equal what?

Mr. CROMWELL. Two silver pesos equal 200 cents, so to speak, Panama silver.

Senator TALIAFERRO. That is, \$1 gold?

Mr. CROMWELL. One dollar gold; yes, sir.

Senator TALIAFERRO. And 3 cents Panama silver is a cent and a half?

Mr. CROMWELL. Yes, sir; a cent and a half gold.

Senator KITTREDGE. And for it you get a dollar in gold?

Mr. CROMWELL. For it you get \$1 American currency.

Senator TALIAFERRO. So that would make the rate $2\frac{1}{2}$, would it not, for exchange?

The CHAIRMAN. One and one-half gold.

Mr. CROMWELL. One and one-half gold, Senator, I understand.

The CHAIRMAN. It would be $1\frac{1}{2}$ gold. You are putting it on a gold basis.

Mr. CROMWELL. You are bringing it down to a gold basis, and bringing it down to a gold basis, I understand it to be $1\frac{1}{2}$ per cent premium.

Senator TALIAFERRO. Is not 3 cents Panaman silver $1\frac{1}{2}$ cents gold?

Mr. CROMWELL. It is equivalent to $1\frac{1}{2}$ cents gold.

Senator TALIAFERRO. Then you pay, in addition to that, \$1 gold?

Mr. CROMWELL. Yes, sir; you pay your \$1 for your \$1, and then you pay your cent and a half for that premium.

Senator TALIAFERRO. So that if a laborer wanted \$100 in exchange the $1\frac{1}{2}$ cents represented by the 3 cents in silver would amount to \$1.50, and the dollar gold would be \$2.50 for that \$100? Figure that out practically.

Mr. CROMWELL. I figure $1\frac{1}{2}$ per cent.

Senator DRYDEN. You take 2 silver pesos, which is a dollar, and 3 cents Panaman silver—that is, $1\frac{1}{2}$ cents American gold—and you buy a draft for \$1 with that.

Senator TALIAFERRO. Suppose we take, Mr. Cromwell, the sum of \$50. A laborer wants \$50 in New York exchange and goes to the

bank. What will it cost him to get it under that agreement—the maximum?

Mr. CROMWELL. I understand $1\frac{1}{2}$ per cent premium on every dollar. That is my understanding of it.

Senator KITTREDGE. In other words, if an employee of the Commission wishes to send a \$50 draft to the United States he would pay 75 cents for it?

Mr. CROMWELL. He would pay 75 cents for it in gold; yes, sir.

Senator TALIAFERRO. Would he pay 75 cents, or would he pay \$1.25?

Mr. CROMWELL. I will get the exact figures for you to-morrow, Mr. Senator.

Senator TALIAFERRO. Do not the 2 silver pesos, which you say means \$1 in gold, apply, whatever the amount of the draft? If he got a draft for \$10 would he not have to pay those 2 silver pesos and then the 3 cents in Panaman silver?

Mr. CROMWELL. If he wanted \$100, say, so as to keep the figures even, for a \$100 draft he would turn in \$200 in silver pesos and 3 cents on every dollar for his premium, which would be \$3, or a total of \$203, as I understand it. For each \$100 of American currency he would turn in \$203 of Panaman silver.

Senator TALIAFERRO. That is what I wanted to get at.

Mr. CROMWELL. I think that is perfectly clear.

Senator TALIAFERRO. So that is 3 per cent?

Mr. CROMWELL. In silver? He turns in \$203 in silver.

Senator TALIAFERRO. Yes, sir.

Mr. CROMWELL. For \$100 in gold, which is, as I have described, a premium of $1\frac{1}{2}$ per cent.

(The committee thereupon adjourned until to-morrow, Thursday, March 1, 1906, at 10.30 o'clock a. m.)

ISTHMIAN CANAL.

COMMITTEE ON INTEROCEANIC CANALS,
UNITED STATES SENATE,
Washington, D. C., Thursday, March 1, 1906.

The committee met at 10.30 o'clock a. m.

Present: Senators Millard (chairman), Kittredge, Dryden, Morgan, and Taliaferro.

TESTIMONY OF WILLIAM NELSON CROMWELL, ESQ.—Continued.

Senator TALIAFERRO. Mr. Cromwell said that he would give us some further information this morning.

Mr. CROMWELL. Yes, Senator; pursuant to your request, I have made some inquiry overnight of the Commission, and I find that I am confirmed in my version of the interpretation of the agreement. If you will permit me, I will read a condensed statement which I think will be clearer for us all than the somewhat general discussion that had arisen, and which I notice, in reading over the minutes of yesterday, toward the end in our cross-fire of answers and questions, was somewhat confused. I will take the liberty of suggesting a few corrections in the minutes at the appropriate time.

We were speaking as we left off yesterday regarding the bankers' agreement of April 29.

The Panama silver peso—that is, the Panama silver dollar—is the equivalent of 50 cents American currency. One cent in Panama silver currency is the equivalent of one-half of a cent in American currency. Now, if we keep that in our minds I think we will read the agreement, all of us, more readily.

Provision A of the agreement—have you a copy of it there, Senator?

Senator TALIAFERRO. Yes; I have. There are very few copies to be had, however.

The CHAIRMAN. We are out of them.

Mr. CROMWELL. Under provision A of article 1 of the agreement of April 29, 1905, the Commission and the railroad company are furnished by the bankers all Panama silver which the Commission or the railroad may call for at the uniform rate of 2 silver pesos for \$1 United States currency—that is, without premium, flat. This money is furnished against the drafts of the Commission or the railroad company, drawn upon the treasury at New York. This silver is actually delivered at the offices of the Commission or the railroad company, as the case may be, at the time of the delivery of the draft, and not before. No commission, discount, or charge whatever is made upon such drafts or for the collection of the same. The United States receives the silver against the drafts and the bankers forward the drafts for collection.

The total pay rolls at the present time are between seven hundred and eight hundred thousand dollars per month; and approximately two-thirds of this sum is for the silver pay roll which I have just referred to, which pay roll is almost entirely non-American labor, being labor from tropical countries. Consequently very little, if any, of this portion of the payment, which is two-thirds of the whole, will be desired for transmission to the United States.

For illustration: A draft on New York for \$100 United States currency will purchase for the United States 200 pesos Panama silver without premium or commission.

Provision B: Provision B covers the cases where either the Commission, the railroad company, or the Republic may desire to transmit money to the United States. In such cases the bankers furnish drafts on New York at the uniform rate of 2 silver pesos and 1 cent for each \$1 of United States currency—that is, at a premium of one-half of 1 per cent gold. This provision is seldom availed of, as I said yesterday, as it very seldom occurs that money is desired to thus be remitted by either the Commission, the railroad company, or the Republic.

Senator TALIAFERRO. Now, Mr. Cromwell—

Mr. CROMWELL. May I finish this clause?

Senator TALIAFERRO. I think while we are just at this point I will get you to elucidate that, to take it up.

Mr. CROMWELL. Yes, sir.

Senator TALIAFERRO. What authority have you for stating, if you mean to state, that under that agreement the banks have the authority to charge only $1\frac{1}{2}$ per cent for exchange?

Mr. CROMWELL. One-half of 1 per cent.

Senator TALIAFERRO. One-half of 1 per cent. Now, where do you get your authority? You are referring to Article B?

Mr. CROMWELL. Article B, which reads so—I think so.

Senator TALIAFERRO. I should be very glad to hear you read it.

Mr. CROMWELL. I think so, sir; I am saying it respectfully, of course.

Article B reads as follows:

“The bankers also likewise severally agree to sell and deliver to the Commission, the railroad company, and to the Republic in the proportions aforesaid all drafts or bills of exchange on New York to be drawn by them, respectively, and to be payable at one day's sight in United States currency at the uniform rate of 2 silver pesos and 1 cent Panama currency for each \$1 of United States currency, which either of said last three named parties may request to be to them so sold upon payment for the same in silver currency of Panama.”

Senator TALIAFERRO. That is $1\frac{1}{2}$ per cent?

Mr. CROMWELL. No, sir; that is one-half of 1 per cent premium.

The CHAIRMAN. That is one-half of 1 per cent.

Mr. CROMWELL. The 1 cent silver, Senator, is only one-half of a cent in gold.

Senator TALIAFERRO. Yes.

Mr. CROMWELL. That is the point. There is where we get confused, I have noticed, several times.

Senator TALIAFERRO. Well, the 2 silver pesos, or \$1—

Mr. CROMWELL. Two silver pesos is equivalent—

Senator TALIAFERRO. To a dollar in gold?

Mr. CROMWELL. Yes, sir; exactly; and the 1 cent is equivalent to half a cent in gold, so that it is \$1.01½ gold.

Senator TALIAFERRO. Then, on a \$100 draft that would be 1½ per cent?

Mr. CROMWELL. No, sir; not 1½, sir.

Senator KITTREDGE. A peso is a dollar in Panama silver.

Mr. CROMWELL. The peso is the Panama silver dollar, as you know, Senator.

Senator TALIAFERRO. One cent Panama currency for each \$1 of United States currency—

Mr. CROMWELL. Yes, sir.

Senator TALIAFERRO (continuing). Would be 1 per cent?

Mr. CROMWELL. No, sir; I beg your pardon, because, you see, there are 2 pesos.

Senator TALIAFERRO. Hear me, Mr. Cromwell—that would be 1 cent Panama silver?

Mr. CROMWELL. Yes, sir; in Panama silver, which is one-half per cent American gold.

Senator TALIAFERRO. Very well. There we have the 1 per cent. Now what, in addition, does the Government pay on a \$100 draft?

Mr. CROMWELL. Nothing.

Senator TALIAFERRO. Two pesos?

Mr. CROMWELL. It pays 2 pesos.

Senator TALIAFERRO. Which is \$1?

Mr. CROMWELL. Yes, sir.

Senator TALIAFERRO. And \$1 and one-half per cent?

Mr. CROMWELL. Not per cent.

Senator TALIAFERRO. On \$100?

Mr. CROMWELL. Not a half per cent, but half a cent.

Senator TALIAFERRO. A half a cent on the dollar?

Mr. CROMWELL. A half a cent on the dollar.

Senator TALIAFERRO. Which is a half per cent—half of 1 per cent?

Mr. CROMWELL. Half of 1 per cent gold—correct.

Senator TALIAFERRO. A half per cent; so that on \$100 the Government would pay 1½ per cent in gold?

Mr. CROMWELL. Not one and a half, sir; one half of 1 per cent, I think.

Senator TALIAFERRO. Well, the 2 silver pesos is \$1 on a hundred dollars exchange?

Mr. CROMWELL. Yes, sir.

Senator TALIAFERRO. That is 1 per cent in gold?

Mr. CROMWELL. The 2 pesos represent \$1 of American currency.

Senator TALIAFERRO. Or gold?

Mr. CROMWELL. Or gold; yes, sir.

Senator TALIAFERRO. Well, that is 1 per cent on \$100.

Mr. CROMWELL. The 2 pesos are not 1 per cent; the 2 pesos are the dollars, the \$2 of Panama silver for the \$1 of American currency; just as, for instance, Senator, the bankers give to the Commission 2 silver dollars for \$1 of currency. Now, that is plain to us both, is it not?

Senator TALIAFERRO. Yes.

Mr. CROMWELL. There is nothing additional there, is there? That is clear-cut. Now, under clause B, of which we are speaking, exactly

the same thing occurs, with the addition only of 1 cent with each 2 pesos, which is one-half of 1 per cent—1 cent is a half cent.

Senator TALIAFERRO. I understand that.

Mr. CROMWELL. The 1 cent silver is half a cent gold, and of course that is one-half of 1 per cent in gold.

Senator TALIAFERRO. Will you take a pencil and piece of paper and show me what, under that clause, a \$100 draft on New York would cost this Government in Panama?

Mr. CROMWELL. Yes, sir.

Mr. CURTIS. It is in your statement—your illustration—Mr. Cromwell.

Mr. CROMWELL. A \$100 draft on New York would cost the United States 201 silver pesos Panama currency, and that is all.

Senator TALIAFERRO. What is the half of that in gold?

Mr. CROMWELL. That is exactly one-half of 1 per cent premium, as I have said several times. You will buy that by laying on the counter 201 silver Panama pesos, and 201 Panama silver pesos is the equivalent of \$100.50.

Senator TALIAFERRO. Go on with your reading. I will take this up in a moment again.

Mr. CROMWELL. Yes, sir. Senator, I do not wonder that it is puzzling to you, because it is very puzzling to all of us, in dealing between these two currencies; but the exact answer to your question is, sir, that it would cost 50 cents to transmit that \$100—only 50 cents.

Senator TALIAFERRO. Well, that is impossible under that agreement.

Mr. CROMWELL. That is the truth. One-half of 1 per cent is exactly what it costs, and the auditor of the Commission tells me that is exactly the way it would operate.

Provision C. Provision C covers the cases where the United States desires United States currency upon the Isthmus to discharge its gold pay rolls, which constitute at present about one-third of the total of its pay rolls. In this instance the bankers are required to furnish the United States currency on the Isthmus at the uniform rate of three-quarters of 1 per cent premium in gold. This rate is no more than it would cost the Government itself to deliver the currency there—namely, the cost of expressage being about three-eighths of 1 per centum; the risk of loss from one-quarter to three-eighths of 1 per centum, making a total of about three-quarters of 1 per centum.

In addition to this the United States, if it remitted the currency itself, as it formerly did, would have to take all the trouble and care of shipment, delivery, etc. This it avoids by the present agreement, which makes the fixed guaranty of three-quarters of 1 per cent. I am told by the auditor of the Commission that the expense of this three-quarters of 1 per cent is just the equivalent of what it formerly cost the Commission.

For illustration: For \$100 United States currency, delivered on the Isthmus by these bankers to the Commission, the railroad company, or the Republic, the bankers receive a draft for \$100.75; that is to say, three-quarters of 1 per cent. Seventy-five cents is paid as premium, and that only, for every \$100 of currency purchased in that way.

Provision D: This covers the public and includes all American labor, and is designed as a protection against violent fluctuations of

exchange. Under it the bankers are compelled to sell to the public of the Isthmus New York exchange at a rate which at no time shall exceed 2 silver pesos and 3 cents Panama silver for \$1 American gold, which is equivalent to a premium of $1\frac{1}{2}$ per cent gold.

For illustration: 203 Panama silver pesos will buy a draft on New York for \$100 United States currency if the maximum premium be ruling, it costing \$1.50 to remit \$100 to New York. In fact, I am told that in practice the rate of exchange has ruled hardly ever as high as that permitted by the agreement, which is 203 silver, $1\frac{1}{2}$ per cent premium gold. It has ruled nearer to 201 and is now ruling at about 201— $1\frac{1}{2}$ per cent.

Senator TALIAFERRO. You are dealing in your illustration with what the agreement permits?

Mr. CROMWELL. Yes, sir. The agreement upon that point, Senator, as you say. Upon that point the bankers have, as you mentioned yesterday, latitude, elasticity. They may run up to 203, but may not exceed it; and the object, of course, of all this was to bring them down to the point where the rate of exchange, the difference, would be almost nominal.

Senator TALIAFERRO. Let us illustrate that, Mr. Cromwell.

Mr. CROMWELL. Yes, sir.

Senator TALIAFERRO. Just make some figures here for a moment. Have you paper there?

Mr. CROMWELL. Yes, sir.

Senator TALIAFERRO. "The bankers also severally agree to sell to the public—that is, to whomsoever may call for and request the same at their respective banking offices in Panama, and who may, at the same time, tender therefore payment in silver currency of Panama—drafts or bills of exchange on New York, drawn by them, respectively, at not more than three days' sight," this says, "at a rate which shall not exceed 2 silver pesos"—

Mr. CROMWELL. Yes, sir.

Senator TALIAFERRO. Now, what is that in gold?

Mr. CROMWELL. That is \$1.

Senator TALIAFERRO. Put that down—"and 3 cents Panama currency for each \$1 United States currency."

Mr. CROMWELL. Yes, sir. That 3 cents is $1\frac{1}{2}$ cents more.

Senator TALIAFERRO. On a hundred dollars, now—figure on \$100.

Mr. CROMWELL. You started with \$1, Senator. I merely want to get the record straight.

Senator TALIAFERRO. I merely want to get the value of those pesos, since you have mentioned \$100.

Mr. CROMWELL. One hundred dollars would be as follows—

Senator TALIAFERRO. Do not look at your notes.

Mr. CROMWELL. No; I am not looking at them. I am looking at the contract.

Senator TALIAFERRO. Excuse me. I thought you were looking at the illustration.

Mr. CROMWELL. No. I am looking at the contract, Senator. On \$100 there would be 200 silver pesos.

Senator TALIAFERRO. Yes. That is, the amount of the two for one. That is the face of the draft?

Mr. CROMWELL. The face; yes.

Senator TALIAFERRO. Now the exchange?

Mr. CROMWELL. Not exchange, but it is a part of it. Then there will be 100 times the 3 cents.

Senator TALIAFERRO. How much is that?

Mr. CROMWELL. Three hundred cents.

Senator TALIAFERRO. That is, \$3?

Mr. CROMWELL. That is \$3.

Senator TALIAFERRO. Divide that by—

Mr. CROMWELL. That is \$3, 3 pesos, 3 Panama dollars.

Senator TALIAFERRO. Yes.

Mr. CROMWELL. That makes 203 Panama dollars.

Senator TALIAFERRO. What has become of your 2 pesos?

Mr. CROMWELL. That 2 pesos and 3 cents is for \$1. You multiply that by 100 and you have 203 pesos for \$100. That is all it is, Senator.

Senator TALIAFERRO. This is the most remarkable case I ever knew in my life.

Mr. CROMWELL. That is all it is, Senator.

Senator TALIAFERRO. I contend that that New York draft for \$100 will cost \$100 for the face of the draft, however you may pay it, whether in American currency or in Panama silver, and \$2.50 American gold for exchange. I contend that the 2 pesos represent \$1 in American gold, and I contend that the 3 cents in Panama silver on each dollar represent \$3 in Panama silver, or \$1.50 in American gold.

Mr. CROMWELL. Yes.

Senator TALIAFERRO. Now, will you tell me where I am mistaken in that?

Mr. CROMWELL. I will endeavor, not in any controversial way—

Senator TALIAFERRO. Oh, no; I am after the information, Mr. Cromwell.

Mr. CROMWELL. Yes, sir.

Senator TALIAFERRO. Answer in your own way.

Mr. CROMWELL. We are reminded that each peso is equivalent to 50 cents United States currency.

Senator TALIAFERRO. Yes.

Mr. CROMWELL. We are reminded that 1 cent is equivalent to one-half a cent United States currency. We approach, then, this language, which reads that we may buy \$1 United States currency for every 2 pesos and 3 cents that is laid on the table.

Now, the value of those 2 pesos and 3 cents is exactly \$1 and one and a half cents. You multiply that by 100, and you get 203 pesos as the equivalent of \$100.

Senator TALIAFERRO. You mean, then, Mr. Cromwell, that the 2 silver pesos mean merely to express the value of an American dollar, and are not put in this provision as conveying the idea that in addition to the 3 cents in Panama silver they must be paid for this exchange?

Mr. CROMWELL. No, sir. I mean that this must be read together, Senator, because it is the cost of the article. For instance, I lay down 2 pesos and 3 cents on the table. The contract so reads. What do I take up from it? One American dollar. That is clear. Now, what is the 2 pesos and 3 cents that I have laid down worth? Anybody will tell us that it is exactly \$1 and one and a half cents United States currency, and that is exactly what the public take it at, Senator. It is dealt in every hour. You can go out this minute on the Isthmus

anywhere and buy exchange on New York, and you can lay down 201 or 202 pesos and get \$100 in gold on New York.

Senator TALIAFERRO. I see it at last, Mr. Cromwell. You are right about it, I think.

Mr. CROMWELL. I thank you, my dear Senator, for your extreme courtesy.

Senator TALIAFERRO. I see there that the 2 silver pesos are not expressed in that provision as an exchange.

Mr. CROMWELL. No, sir.

Senator TALIAFERRO. But to show what the American dollar is worth in Panama silver.

Mr. CROMWELL. You are right, sir; and I deeply appreciate the extreme courtesy of your question and your frankness. I may say, sir, in justice to us all—we all of us got confused yesterday afternoon, you remember—

Senator TALIAFERRO. Yes.

Mr. CROMWELL. That when you attempt to deal in exchange, and the difference in the two currencies, it is a very puzzling thing, and I taxed my own mind to clarify it in the way I have described to you this morning. It confirms the statement, gentlemen, that I have made—that you get all of your silver currency upon the Isthmus without the cost of a penny.

The CHAIRMAN. I think we all understood that, Mr. Cromwell.

Senator TALIAFERRO. Did you conclude your statement?

Mr. CROMWELL. Yes, sir.

Senator MORGAN. Was this arrangement, Mr. Cromwell, intended in whole or in part to get rid of the Colombian currency that was in the Isthmus?

Mr. CROMWELL. No, sir; that was a separate matter, Senator.

Senator MORGAN. A separate matter?

Mr. CROMWELL. Yes, sir.

Senator MORGAN. There was a purpose to do that?

Mr. CROMWELL. Yes, sir; there was; and anterior to this the Republic of Panama had decided to retire all of the Colombian silver.

Senator MORGAN. Why?

Mr. CROMWELL. Naturally they wanted the coin of their own country.

Senator MORGAN. Was there any difference between the coin—between the pesos?

Mr. CROMWELL. Yes; but it was a different weight and a different value, and, moreover, it was not the coin of the nation, of course.

Senator MORGAN. What was the difference in the value of the two coins?

Mr. CROMWELL. I can not describe them to you precisely, Senator. It is a material difference of perhaps 10 or 15 per cent in real value. I can get you the figures, if you desire.

Senator MORGAN. Is the Colombian coin of greater value or less value than the Panama coin?

Mr. CROMWELL. Lesser value.

Senator MORGAN. Lesser value?

Mr. CROMWELL. Yes, sir.

Senator MORGAN. Panama wanted to get the cheaper currency out of the country?

Mr. CROMWELL. Yes, sir.

Senator MORGAN. And put their currency in the place of it—a higher value of the same denomination?

Mr. CROMWELL. Yes, sir.

Senator MORGAN. About the size of the pesos—the Colombian and the Panama pesos—how did they correspond?

Mr. CROMWELL. I think they are substantially the same. I doubt if I ever have seen one, Senator. I do not think I have ever seen a Colombian peso.

Senator MORGAN. You think you have never seen one?

Mr. CROMWELL. I think I have never seen one.

Senator MORGAN. Have they entirely disappeared from that country?

Mr. CROMWELL. Yes, sir; they have disappeared as a legal tender or coinage.

Senator MORGAN. I know; but I am talking about actual circulation.

Mr. CROMWELL. Oh, physically, there may be a few coins, but they are almost all taken up. It is understood that they are retired, because now they have no more value than bullion value, which is a depreciated value.

Senator MORGAN. Yes.

Mr. CROMWELL. They are not circulated upon the Isthmus.

Senator MORGAN. Were they redeemed or bought up by the Panama Government?

Mr. CROMWELL. They were redeemed; yes, sir.

Senator MORGAN. Redeemed by the Panama Government?

Mr. CROMWELL. Yes, sir.

Senator MORGAN. In what?

Mr. CROMWELL. In the new coins.

Senator MORGAN. At a discount, or at face value?

Mr. CROMWELL. At a rate of $212\frac{1}{2}$. The Congress of Panama passed a law creating the new coinage, and authorizing the new coinage to be issued in exchange to retire the then existing Colombian coin upon the Isthmus at the uniform rate of $212\frac{1}{2}$ up to a fixed date, which fixed date expired, I think, February 12 of last year.

Senator MORGAN. What do you mean by “at the uniform rate of $212\frac{1}{2}$?”

Mr. CROMWELL. They redeemed them—all coins of Colombia then existing on the Isthmus were to be tendered by due advertisement all through each province of the nation.

Senator MORGAN. Brought in?

Mr. CROMWELL. Yes, sir; and a treasury established in each province of the nation, and all Colombian coins were to be deposited by that date, a long advertisement and notice being given.

Senator MORGAN. What became of it if it was not then deposited?

Mr. CROMWELL. Then it ceased to be legal tender, and only had its bullion value.

Senator MORGAN. It had its bullion value?

Mr. CROMWELL. Yes, sir.

Senator MORGAN. What about the $212\frac{1}{2}$?

Mr. CROMWELL. That was the figure fixed by the Panama Congress.

Senator MORGAN. What does it mean?

Mr. CROMWELL. It means that they would pay at a premium—that is to say, they would value their own coins at $212\frac{1}{2}$ and redeem Colombian currency at that figure.

The CHAIRMAN. That is $212\frac{1}{2}$ gold, I suppose?

Mr. CROMWELL. No; $212\frac{1}{2}$ silver pesos, which is $106\frac{1}{4}$ American gold.

Senator MORGAN. $212\frac{1}{2}$ silver pesos would stand in place of $106\frac{1}{4}$ American gold?

Mr. CROMWELL. American gold; yes, sir. It would be the equivalent of that.

Senator MORGAN. How much in Panama gold?

Mr. CROMWELL. There is no Panama gold, sir.

Senator MORGAN. There is none?

Mr. CROMWELL. No, sir. There is a coinage, Senator, authorized by law, which is called the "balboa," but none has actually been coined.

Senator MORGAN. These merchant banks or bank merchants, whatever they are, down there, who conduct a queer sort of a financial and dry-goods business mixed together, as I understand it, do they still continue to take the Colombian peso?

Mr. CROMWELL. No, sir; they do not.

Senator MORGAN. They do not take it at all?

Mr. CROMWELL. I do not know their actual practice, Senator. It is a coin that no longer has circulation in the country, any more than a British sovereign would have circulation here, except by courtesy.

Senator MORGAN. What coins are in circulation by legal authority in Panama to-day?

Mr. CROMWELL. The coinage of the Panama Republic, of the character I have described.

Senator MORGAN. What is that coinage of the Panama Republic; what are the denominations?

Mr. CROMWELL. The denominations of the pesos? I am trying to find for you, Senator, the technical term; that is all.

Senator MORGAN. Well, a peso and subdivisions?

Mr. CROMWELL. A peso—I had better give you the exact language.

Senator MORGAN. Does a peso represent our idea of half a dollar or a dollar?

Mr. CROMWELL. It is the Panama dollar. It is equivalent to our 50 cents.

Senator MORGAN. That is, there is a half dollar, is there?

Mr. CROMWELL. There is a half dollar.

Senator MORGAN. A quarter of a dollar?

Mr. CROMWELL. A quarter of a dollar, 10 cents, and 5 cents.

Senator MORGAN. All corresponding to the value of the peso?

Mr. CROMWELL. Yes, sir.

Senator MORGAN. Were those the coins you exhibited yesterday to the committee?

Mr. CROMWELL. Yes, sir.

Senator MORGAN. Have you got them now?

Mr. CROMWELL. I think I have not, Senator. I changed my clothes, and left them at the hotel. I can get them for you. I think I have not them here, sir.

Senator MORGAN. In what way are they distinguishable from the Colombian peso?

Mr. CROMWELL. As I said, I do not think I ever saw a Colombian peso.

The CHAIRMAN. Mr. Cromwell, right there, have you the different coins of the Republic? Could you furnish them to the committee?

Mr. CROMWELL. I have a set of the present coins, which I exhibited to you yesterday.

Senator MORGAN. You showed them; you did not give them to us!

Mr. CROMWELL. No; I say I exhibited them to you yesterday.

The CHAIRMAN. Would you be willing to loan them to the committee for a day or two?

Mr. CROMWELL. Oh, certainly. I took them from my library, because the Republic gave them to me as a compliment, being the first of the coins.

The CHAIRMAN. If you will, please.

Mr. CROMWELL. I will bring them up. They are in my other coat.

Senator MORGAN. Is there any American coinage in circulation on the Isthmus?

Mr. CROMWELL. Yes, sir.

Senator MORGAN. How does it rate?

Mr. CROMWELL. I do not know precisely, sir.

Senator MORGAN. You do not know how it rates as compared to the peso of Panama silver?

Mr. CROMWELL. I do not know precisely, Senator. I understand that the American silver circulates quite freely and quite acceptably.

Senator MORGAN. The American half dollar is about the size of the Panama peso?

Mr. CROMWELL. Yes, sir; it is.

Senator MORGAN. Just about the same size?

Mr. CROMWELL. Nearly.

Senator MORGAN. And the same weight?

Mr. CROMWELL. Yes, sir.

Senator MORGAN. And the same fineness?

Mr. CROMWELL. Its similitude is very much as I have said.

Senator MORGAN. How much more is an American half dollar worth than a Panama peso?

Mr. CROMWELL. I do not know, sir.

Senator MORGAN. A little more, is it not?

Mr. CROMWELL. It is worth a little more; yes, sir; but I do not know the precise figures.

Senator MORGAN. But they pass currently for the same thing, do they not?

Mr. CROMWELL. Not entirely. They do in the shops, I am told.

Senator MORGAN. In the shops—that is what I am talking about. I am talking about the purchases made by the laborers, etc.

Mr. CROMWELL. But among the people they do not; no.

Senator MORGAN. They use the American coin and the Panama peso indifferently? A peso is a half dollar, and a half dollar is a peso, in the shop transactions?

Mr. CROMWELL. The shopkeepers, of course, know the distinction, I am told. All this I am speaking of is only from information, Senator, because I never have had any experience on that subject.

Senator MORGAN. When we get down to bullion values, the shopkeepers have a pretty great advantage over the traders, do they not, in that arrangement?

Mr. CROMWELL. Well, I think they would take advantage of a dual currency, and I think, therefore, that there is mischief in having a dual currency.

Senator MORGAN. You think that is the mischief of it?

Mr. CROMWELL. Yes; I do, Senator.

Senator MORGAN. Do you not think that currency was intended to impose upon those negroes down there and get them to circulate these coins, one for the other, without respect for their bullion value?

Mr. CROMWELL. I do not know of any intention at all about it, sir.

Senator MORGAN. Is not that the tendency? Is not that the opportunity?

Mr. CROMWELL. I know that if the Panama coins are circulated there can be no imposition, because they have a fixed and standard value.

Senator TALIAFERRO. Mr. Cromwell, you certainly must know whether there was any intention or not. You drew this agreement.

Mr. CROMWELL. Any intention to do what, sir?

Senator TALIAFERRO. To put this currency out there in a way that would confuse the negroes so that they might be imposed upon.

Mr. CROMWELL. Oh, no! On the contrary, the very object of this arrangement was to have a uniform currency, a currency of the country which all the plain people would understand—which all the Latins and all that Spanish people would understand—the peso. They understand it. They take the Panama coinage, and there is no confusion or deception about the Panama coinage. The only possible confusion or deception that can arise is by the injection of any other coinage.

Senator MORGAN. Which has the advantage in circulation as a fact, as a general occurrence—the Panama peso or the American half dollar?

Mr. CROMWELL. I have no experience on the Isthmus at all, Senator.

Senator MORGAN. And of course there are minor coins, a quarter of a dollar, and so on, in currency?

Mr. CROMWELL. Yes, sir; quarters and tens—dimes.

Senator MORGAN. And a dime?

Mr. CROMWELL. Dimes and 5-cent pieces.

Senator MORGAN. And a nickel?

Mr. CROMWELL. No, sir; it is called a 5-cent piece.

Senator MORGAN. A silver piece?

Mr. CROMWELL. Yes, sir; they are all silver pieces.

Senator MORGAN. It is not the little picayune we used to have, is it?

Mr. CROMWELL. Yes; it is the same as that, as small as the finger nail.

Senator MORGAN. That is in circulation; and you had a coin yesterday, if I saw correctly, that was a sort of an admixture, did you not?

Mr. CROMWELL. No, sir; they were all in series, right down the list. I will bring them to you to-morrow morning, Senator.

Senator MORGAN. You will bring them here to-morrow? All right. We will try to get through to-day, but I do not think we can.

Mr. CROMWELL. I should regret it; I do not want to lose your good company.

Senator MORGAN. Well, sir, you can have my company with the greatest possible pleasure and with all of my activity remaining of mind and body to contribute to your satisfaction and to assist you in trying to tell something to this committee. [Laughter.] Now, I will go to more recondite and not less serious things.

A letter was written by J. Bonnardel, president of the board of directors, and certified by the secretary of the company, Ed. Lampre. Do you know Ed. Lampre?

Mr. CROMWELL. Yes, sir.

Senator MORGAN. He is a lawyer?

Mr. CROMWELL. Yes; he is a lawyer and the secretary of the Panama Canal.

Senator MORGAN. Secretary of the Panama Canal Company, and he was counsel for the canal company in Paris?

Mr. CROMWELL. No, sir; no, sir.

Senator MORGAN. Who was?

Mr. CROMWELL. Oh, they had half a dozen counsel there.

Senator MORGAN. Who was the leading counsel—the main man like you are over here?

Mr. CROMWELL. The counsel of the company comprise Mr. Waldecke-Rousseau, the ex-premier of France, the leader of the French bar, and Mr. Dubuit. Those are the leading counsel.

Senator MORGAN. You call them "leading." Are they the counsel to whom the company intrusts the management of its business?

Mr. CROMWELL. They are the counsel whom it consults principally.

Senator MORGAN. Are they consulting counsel or are they the counsel having active charge of the business of the company?

Mr. CROMWELL. They are consulting counsel, sir.

Senator MORGAN. Only consulting? Who is the active business lawyer?

Mr. CROMWELL. The company has no active business lawyer in the sense you refer to.

Senator MORGAN. I understood Mr. Lampre was.

Mr. CROMWELL. No, sir; he was not, Senator; he is the secretary.

Senator MORGAN. This letter is dated Paris, November 18, 1898. It is addressed to the President of the United States. I will read a part of it and put it all in the record, and I will read it all if you want me to. [Reading:]

"To the PRESIDENT OF THE UNITED STATES.

"SIR: The New Panama Canal Company believes it to be its duty to respectfully submit the following statement:

"It is common knowledge that in 1889 the Compagnie Universelle du Canale Interocéanique de Panama, the old company, fell into financial difficulties after about one-third of the canal had been finished. The rights of that company then passed judicial administration. A liquidator (receiver) was appointed by the judgment of the civil tribunal of the Seine, under date of the 4th of February, 1889. During this administration (1889-1894), and with the authorization of the court, the greatest care was taken to preserve and maintain the work already done, and a prolongation was obtained from the Republic of Colombia of the time stipulated for the completion of the canal, thus preserving the rights of the company under its concession in their entirety."

Do you know the length of that prolongation? To what period of time was that prolonged?

Mr. CROMWELL. On April 4, 1893, a further extension was obtained.

Senator MORGAN. By what company?

Mr. CROMWELL. That was obtained by the receivership.

Senator MORGAN. By the receivership?

Mr. CROMWELL. Yes, sir.

Senator MORGAN. To what period did that extension go?

Mr. CROMWELL. That was extended for the period expiring October 31, 1894.

Senator MORGAN. October 31, 1894?

Mr. CROMWELL. 1894.

Senator MORGAN. What did that cost the receiver—the liquidator?

Mr. CROMWELL. That cost the receiver 12,000,000 francs. The receiver was to pay 2,000,000 francs in addition to the 10,000,000 provided by the concession of 1890, from which were to be deducted 4,000,000 francs due from Colombia and the Department of Panama to the old company.

Senator MORGAN. Yes. Now, proceed to the next concession, if you please.

Mr. CROMWELL. In the interval, in 1894, the new company was formed during the pendency of that extension. It became evident that it was desirable to extend the time, and this time was, by executive decree of Colombia, approved April 26, 1900, extending for six years from the expiration of the period previously fixed—that is, until October 31, 1910.

Senator MORGAN. What was the date of that extension?

Mr. CROMWELL. April 26, 1900.

Senator MORGAN. What was paid for it?

Mr. CROMWELL. Five million francs gold.

Senator MORGAN. There is one extension that I think you must have overlooked there; it is the one in which—

Mr. CROMWELL. Not within the period that you named, Senator.

Senator MORGAN. It was not a later period; I am sure of that.

Mr. CROMWELL. No, sir; it was an earlier period.

Senator MORGAN. Yes; an earlier period. There is one that you have overlooked, and that was the extension that was paid for in part by 5,000,000 francs of stock, I believe it was, in the New Panama Canal Company.

Mr. CROMWELL. Yes; and, Senator, my answer was correct with reference to the questions which you addressed to me. But I see that you desire to ask about an earlier period.

Senator MORGAN. I want to ask you about that concession; yes, sir.

Mr. CROMWELL. And I will go back and add that for you.

Senator MORGAN. All right.

Mr. CROMWELL. Would a quick résumé of the several extensions be of use to you, if I put them together?

Senator MORGAN. I do not know that it would be of any particular service.

Mr. CROMWELL. I think I can give it to you in a very few words.

Senator MORGAN. Very good; put it together, then.

Mr. CROMWELL. The original concession was obtained in 1878. Then, on December 26, 1890, an extension was granted for the completion of the canal upon the condition, among other things, that a

new company should be formed and should resume work on the canal before February 28, 1893, and that the receiver should transfer to it the plant of the old company. The receiver was further to pay Colombia 10,000,000 francs, less 2,000,000 francs then owed by the Government to the old company, and Colombia was to receive shares of the new company to be formed of a par value of 5,000,000 francs.

Subsequently there were extensions of 1890 and that of 1900, to which I have previously alluded.

Senator MORGAN. Now state the amount of money—the amount of francs—that Colombia was to get for that concession.

Mr. CROMWELL. For the extension of 1890, Senator—that was under the receivership—the receiver was to pay Colombia, and did pay Colombia, 10,000,000 francs, less 2,000,000 francs that Colombia already owed them; and Colombia was to receive shares of the new company to be formed of a par value of 5,000,000 francs also.

Senator MORGAN. That is a million dollars, in round figures?

Mr. CROMWELL. In round figures, a million dollars; yes, sir.

Senator MORGAN. Very good. Now, then, this stock that was issued to Colombia was issued as a part of the arrangement for the formation of the new company?

Mr. CROMWELL. Yes, sir; and for the extension.

Senator MORGAN. You had 65,000,000 francs of capital in that company?

Mr. CROMWELL. There were 65,000,000.

Senator MORGAN. And Colombia got 5,000,000 of them?

Mr. CROMWELL. Five million were set aside under this provision I have just read in respect of Colombia, but not delivered to Colombia.

Senator MORGAN. Yes; and that was in consideration of her consenting to the formation of the new company and also the prolongation of the concession?

Mr. CROMWELL. It was for the prolongation of the concession.

Senator MORGAN. And only that?

Mr. CROMWELL. I have not the terms of the grant here, Mr. Senator.

Senator MORGAN. I was going to ask you whether, if you understood the terms of that contract, it was not that the new company would pledge Colombia to complete the canal—raise the money and complete the canal?

Mr. CROMWELL. I dislike, sir, to speak from memory; but I wish to assist the progress of the inquiry. We can easily get the documents, because they are all a matter of public record.

Senator MORGAN. Yes; the documents are spread out here, but I want to see how much you remember about it. After that prolongation, was any other prolongation made?

Mr. CROMWELL. Yes; the other two to which I referred, namely, that of 1893 and that of 1900.

Senator MORGAN. Yes. Now, what was the date of that concession of 1893?

Mr. CROMWELL. The date of the one of 1893, sir, was April 4.

Senator MORGAN. How long did that extend?

Mr. CROMWELL. That extension was dated April 4, 1893, and ran for the period of ten years from the date of the organization of the

new company to be formed, which organization took place in October, 1894—

Senator MORGAN. October 31?

Mr. CROMWELL. October 31, 1894, which therefore continued that extension up to October 31, 1904.

Senator MORGAN. Now, what did they pay for that concession?

Mr. CROMWELL. Shall I repeat that?

Senator MORGAN. You have already expressed that, have you?

Mr. CROMWELL. Yes, sir.

Senator MORGAN. That was a part of the agreement for the formation of the company?

Mr. CROMWELL. Yes, sir.

Senator MORGAN. That included the stock that has been issued?

Mr. CROMWELL. No, sir; not that extension.

Senator MORGAN. Very good; what was paid for it?

Mr. CROMWELL. That is all in the record.

Senator MORGAN. Very good—yes. Now, the last concession, then, from 1893, which by the arrangement spoken of was carried down or extended to October 31, 1904—

Mr. CROMWELL. Yes, sir.

Senator MORGAN. What did that cost?

Mr. CROMWELL. That cost 10,000,000 francs.

Senator MORGAN. Two million dollars or thereabouts?

Mr. CROMWELL. Yes, sir. As I have said, the receiver was to pay 2,000,000 francs in addition to the 10,000,000 provided by the concession of 1890, from which were to be deducted 4,000,000 francs due from Colombia and the Department of Panama to the old company for advances it had made.

Senator MORGAN. Yes. What was the sum of money that was coming to the Colombian Government on the sale of that concession after settlement of the affairs—what sum of money?

Mr. CROMWELL. What remained?

Senator MORGAN. Yes.

Mr. CROMWELL. Eight million francs; and that was paid.

Senator MORGAN. The actual date of it was some little time before the 31st of October, 1893?

Mr. CROMWELL. Yes, sir; all in anticipation, of course, of a forthcoming expiration.

Senator MORGAN. Now, you obtained from Colombia a still later concession. What was the date of that?

Mr. CROMWELL. The last one, and the existing one, was obtained April 6, 1900, and ran for the period expiring October 31, 1910.

Senator MORGAN. You say it was obtained; when was it contracted for?

Mr. CROMWELL. That is the date, sir—the date of the contract.

Senator MORGAN. That is the date of it, but when was it contracted for?

Mr. CROMWELL. It is not long before that, Senator.

Senator MORGAN. Well, let us get as close to that as we can.

Mr. CROMWELL. Oh, if you think it material, I will get it for you, sir. [After examining papers.] The date of the executive decree of Colombia was April 26, 1900.

Senator MORGAN. That was after Marroquin got into office—no; it was just before.

Mr. CROMWELL. I do not remember.

Senator MORGAN. It was just before; yes. At what time was the first overture made to Colombia for that concession?

Mr. CROMWELL. I do not know, Senator. I had no part, no duty with respect to it, sir.

Senator MORGAN. You have no means of information about it?

Mr. CROMWELL. No, sir; I had no part in obtaining it.

Senator MORGAN. Who conducted the business?

Mr. CROMWELL. It was conducted directly from the Paris office. I do not know who conducted it. It was merely a matter of business negotiation. Colombia exacted 5,000,000 francs for the extension. The extension was obtained and the 5,000,000 francs were paid.

Senator MORGAN. Have you no means of ascertaining whether that was as early as 1898?

Mr. CROMWELL. No, sir; I have no means to ascertain.

Senator MORGAN. That concession hung on a long time before it was granted by Colombia, did it not?

Mr. CROMWELL. I do not know, sir.

Senator MORGAN. There was great difficulty about getting it, was there not?

Mr. CROMWELL. I truly do not know, because I had no professional relation to that subject.

Senator MORGAN. Who was the agent of the Panama Canal Company in Colombia negotiating and conducting and pressing the granting of that prolongation?

Mr. CROMWELL. I do not know anything about it.

Senator MORGAN. Was it a man named Mensina?

Mr. CROMWELL. The official representative of the company in the city of Bogota was Mr. Mensina. The concession required that the company should appoint at all times and have at the capital of the nation an official agent.

Senator MORGAN. Yes.

Mr. CROMWELL. It was pursuant to that law——

Senator MORGAN. Was Mensina in any way under your control?

Mr. CROMWELL. Not under my control.

Senator MORGAN. You testified the other day that you were the general counsel of the Panama Canal Company in Colombia.

Mr. CROMWELL. I stated that I was their general counsel in all matters pertaining to Colombia and Panama in the United States.

Senator MORGAN. Were you informed of what Mensina was doing down there?

Mr. CROMWELL. No, sir.

Senator MORGAN. You have no information on the subject?

Mr. CROMWELL. None whatever.

Senator MORGAN. And no correspondence with him?

Mr. CROMWELL. None whatever. I had nothing to do with the subject.

Senator MORGAN. Who was your correspondent down there?

Mr. CROMWELL. I had nothing to do with that subject.

Senator MORGAN. Who was your correspondent down there?

Mr. CROMWELL. I must beg to be excused, if you are going to go into the matter of my professional relations to the canal company.

Senator MORGAN. Your professional relations appear and disap-

pear so rapidly that I never know when I am touching on them.
[Laughter.]

Mr. CROMWELL. You are a good lawyer, and you ought to know without being told.

Senator MORGAN. I am not as good a lawyer as it requires to ascertain when a man's professional obligations bounce up and stop the ship, and then again when they sink out of sight, as he wants to progress with his voyage. I can not understand that. I am not that sort of a lawyer.

Mr. CROMWELL. You are so many sorts of a lawyer that I should think you would be equal to any such emergency.

Senator MORGAN. Did you have anybody under your control and as your representative and correspondent as counsel of this company in Bogota while that concession was under discussion?

Mr. CROMWELL. No, sir.

Senator MORGAN. You had nobody there?

Mr. CROMWELL. No, sir.

Senator MORGAN. Did you have any discussion with anybody in Bogota about it?

Mr. CROMWELL. No, sir.

Senator MORGAN. Did you receive information from Bogota?

Mr. CROMWELL. Not the least.

Senator MORGAN. In regard to it?

Mr. CROMWELL. I had nothing to do with it.

Senator MORGAN. You were entirely ignorant of it?

Mr. CROMWELL. Absolutely, Senator.

Senator MORGAN. You must have received some information about it.

Mr. CROMWELL. I received information from the fact that it had been granted, of course.

Senator MORGAN. From whom did you receive it?

Mr. CROMWELL. Some officer of the company.

Senator MORGAN. Who was that officer?

Mr. CROMWELL. One of the new officers of the Panama Canal Company, during one of my visits to Paris.

Senator MORGAN. An officer residing in Bogota?

Mr. CROMWELL. No, sir; one of the officers of the company in Paris.

Senator MORGAN. Did you have any communication with anybody at Bogota about this business?

Mr. CROMWELL. Not the remotest, Senator. I can not claim any credit for that service.

Senator MORGAN. You can not claim any credit for it?

Mr. CROMWELL. No, sir.

Senator MORGAN. And if there is any discredit about it, you do not want to claim that, of course?

Mr. CROMWELL. There is no discredit, sir, for getting an extension and paying the honest bill for it.

Senator MORGAN. There were about 100,000 people killed in consequence of it and 6,000,000 of debts forced upon Colombia by that very transaction. I think there is possibly some danger, if not discredit, connected with that.

Mr. CROMWELL. I have seen no trace of those horrors that you speak of.

Senator MORGAN. Well, if you have not, it is because you shut your eyes to them.

Was not this letter of Bonnardel's, dated November 18, 1898, written after the proposition was made to the Colombian Government to grant a concession?

Mr. CROMWELL. I do not know, sir.

Senator MORGAN. When did San Clemente come in and take office as President?

Mr. CROMWELL. I do not know, sir.

Senator MORGAN. Who was his predecessor?

Mr. CROMWELL. I do not know, sir.

Senator MORGAN. Who followed San Clemente?

Mr. CROMWELL. Marroquin, I think.

Senator MORGAN. How do you know that?

Mr. CROMWELL. From memory.

Senator MORGAN. You have memory about that and no memory about these other things?

Mr. CROMWELL. I have memory of what I have memory for, and what I have not you can not make me remember.

Senator MORGAN. I see I can not make you remember.

Mr. CROMWELL. Even with your fertility of manufacture.

Senator MORGAN. I give it up. Do you recollect the year in which Marroquin became President, as vice-president?

Mr. CROMWELL. No, sir.

Senator MORGAN. Of course you do not remember the time of the year, then?

Mr. CROMWELL. That follows.

Senator MORGAN. Yes. Was it before or after the payment of this money that you have just spoken of as the price of that concession?

Mr. CROMWELL. I do not know, sir.

Senator MORGAN. You do not know?

Mr. CROMWELL. No, sir.

Senator MORGAN. Mr. Chairman, I will introduce this letter into the record, without detaining the committee further upon it.

Senator KITTREDGE. Have you read all of it?

Senator MORGAN. No. Do you wish it all read? I wish to continue the examination.

Senator KITTREDGE. I can look at it later.

Senator MORGAN. Very good.

Senator KITTREDGE. I do not see the materiality of this

(The letter referred to will be found at the end of to-day's proceedings.)

Senator MORGAN. Bonnardel's letter was dated November 18, and this letter is dated December 5, 1898, and signed William Nelson Cromwell, counsel for the New Panama Canal Company. I wish to read that to you, first asking if you remember having written such a letter?

Mr. CROMWELL. Tell me what the letter is, and I can tell you. The date has no significance to me. Kindly give me the substance, and I will tell you.

Senator MORGAN. I will read it, then. It was addressed to Mr. Hay. [Reading:]

Mr. Cromwell to Mr. Hay.

NEW YORK, December 5, 1898.

MY DEAR SIR: I beg leave to confirm the telegram which I sent you at 10.45 this morning, as per inclosure.

Upon my return I learned through Director-General Hutin, who had preceded me to New York, that the measure which had just been acted on by one branch only of the Colombian Congress was a bill to authorize the executive to negotiate the terms of and to conclude a further prorogation of six years from 1904 for the completion of the canal, under a communication which the company had addressed to the Government, in the form of which I inclose you a translation.

You will note that the company specifically stated to the Government that the prorogation was not a matter of absolute necessity, but was desirable in the interests of commerce and navigation to enable an even deeper cut to be made (and which would reduce the number of locks to four), but which reduction would, of course, require more time than the plan adopted.

You will note that the bill proposed to confer power upon the Executive, and this happened to arise under extraordinary political conditions in Bogota. As you have probably been advised through official channels, a serious difference has recently been existing between the House of Representatives of Colombia and the President, the House having passed formal resolution declaring the office of President vacant and refusing to recognize the qualification of the President before the supreme court.

We therefore construe the action of the House of Representatives as only a part of the strife between the House and the President and not a declaration of the policy of the nation or the Congress in respect of the Panama Canal and as not evidencing hostility to the company itself. We are the more confirmed in this belief because of the uniform consideration and cordiality displayed by the Congress and the Government to the New Panama Canal Company, which we have no doubt their minister at Washington would fully confirm to you.

Our company has not the least apprehension regarding any prorogation of its concessions it may consider necessary in the future.

I have, etc., your obedient servant,

WM. NELSON CROMWELL,
Counsel New Panama Canal Company.

Do you recall that letter?

MR. CROMWELL. That is a part of the professional service which I have performed to the Panama Canal Company, and I beg to be excused from interrogations concerning it.

SENATOR MORGAN. We can not excuse you; at least I can not. I will ask you the question, Do you remember the letter?

MR. CROMWELL. I beg to be excused from any interrogation regarding any business—

SENATOR MORGAN. You can not exactly put a gag in the mouth of a Senator at this committee table and refuse him permission to ask you a question. I ask you the question and I ask you to answer.

(By request the stenographer read the pending question, as follows:)

"Do you remember the letter?"

Mr. CROMWELL. The letter speaks for itself. It is a matter of public record. I have no comment to make upon it.

Senator MORGAN. Do you remember it?

Mr. CROMWELL. I do.

Senator MORGAN. From what sources did you get that very important information contained in those letters?

Mr. CROMWELL. I respectfully beg to be excused from any statement or discussion of the affairs of my clients.

Senator MORGAN. Did that letter contain the truth as you understood it?

Mr. CROMWELL. I respectfully beg to be excused from a discussion of the affairs of my clients.

Senator MORGAN. I did not ask if it contained falsehood. Do you want to be excused from telling the truth about it?

Mr. CROMWELL. I beg to be excused from a discussion of the affairs of my clients.

Senator MORGAN. You decline to say whether that letter contains the truth as you understood it?

Mr. CROMWELL. I decline to be drawn into a discussion of the affairs of my clients.

Senator MORGAN. You have already spoken of that concession. That has been mentioned here in your testimony this morning.

Mr. CROMWELL. That is a part of the record titles of the Panama Canal Company and part of the records of the Government of the United States, and I very properly referred to it.

Senator MORGAN. Having made the disclosure of your knowledge of the fact that that concession was then under negotiation and what was given for it, and so forth, I ask you, on the basis of that disclosure, to explain to this committee fully the whole transaction.

Mr. CROMWELL. The statement which I have made to you is no disclosure. The statement I have made to you concerning the extension is a matter of record in the opinions of the Attorney-General and upon file in the archives of the Government of the United States passing the title of the New Panama Canal Company.

Senator MORGAN. If so, give your recollection of what those records contain.

Mr. CROMWELL. The information I have given you this morning is based upon the opinions which have been passed by the Attorney-General, and which are a part of the archives of this Government. They are not confidential communications, and for that reason, and for that reason alone, have I stated them to you.

Senator MORGAN. Will you state your recollection of what those records contain?

Mr. CROMWELL. The opinion of the Attorney-General?

Senator MORGAN. As you have given it there, and as you have given it here, and as it is recorded, and as you have sworn to it. As you have refused to state what you know, I want to know if you refuse to state what you recollect of the contents of those records?

Mr. CROMWELL. Senator, I respectfully decline to be drawn into a discussion involving confidential relations.

Senator MORGAN. I am not attempting, nor have I any privilege of discussing anything with you. It is my duty, as an officer of the Government of the United States and as a member of the Senate

and as a member of this committee, to ask you questions to bring out information material to the inquiry in this matter, and not to discuss it. I ask you the questions to get the information that you evidently have, and I ask you whether you will disclose it?

Mr. CROMWELL. I repeat my answer, sir.

Senator MORGAN. There was a telegram mentioned in this letter as having been sent by you to Mr. Hay, Secretary of State: "I beg leave to confirm the telegram which I sent you at 10.45 this morning, as per inclosure." What was that telegram?

Mr. CROMWELL. I respectfully beg to be excused, for the same reason.

Senator MORGAN. Well, there was an inclosure in that letter, was there not?

Mr. CROMWELL. I repeat my answer.

Senator MORGAN. You refuse to state?

Mr. CROMWELL. I do.

Senator MORGAN. Did you write that letter?

Mr. CROMWELL. I did.

Senator MORGAN. And there was an inclosure in it?

Mr. CROMWELL. I decline to state.

Senator MORGAN. Will you give the substance of that inclosure?

Mr. CROMWELL. I decline to answer.

Senator MORGAN. You refuse to answer?

Mr. CROMWELL. I do refuse to answer.

Senator MORGAN. Yes. I do not propose to stop this——

Mr. CROMWELL. Whatever was inclosed is a matter of public record, and you can get it at the State Department.

Senator MORGAN. It might not suit the convenience of the committee to get the public records in this matter, and as you know it, why can you not state it?

Mr. CROMWELL. I am under the obligations of professional duty, as you are under certain obligations which you consider.

Senator MORGAN. Is it true, Mr. Cromwell, that you are now under a professional obligation to refuse to state the contents of this letter or of the telegram inclosed in it?

Mr. CROMWELL. It is.

Senator MORGAN. Is that true?

Mr. CROMWELL. It is, and you ought to know it, as a lawyer.

Senator MORGAN. I do not know it and I do not believe it.

Mr. CROMWELL. Then your faculties are not at their full power.

Senator MORGAN. I would be sorry if they had the power to put such a gloss as that over the truth.

Did you know at that time, as William Nelson Cromwell, that a war was about to break out in Colombia?

Mr. CROMWELL. I did not.

Senator MORGAN. Did you know it as counsel for the company?

Mr. CROMWELL. If I knew it as counsel of the company I should refuse to state it.

Senator MORGAN. Even that a war was about to break out?

Mr. CROMWELL. Well, that is a hypothetical question, Senator. I did not know anything about it.

Senator MORGAN. You did not know that a war was about to break out? Did you know what the quarrel was between the President of Colombia and the Panama Canal Company at that time?

"Do you remember the letter?"

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Mr. CROMWELL. Well, that is a hypothetical question, Senator. I did not know anything about it.

Senator MORGAN. You did not know that a war was about to break out? Did you know what the quarrel was between the President of Colombia and the Panama Canal Company at that time?

Mr. CROMWELL. I respectfully decline to answer.

Senator MORGAN. Had the Panama Canal Company then made an overture or a request of the Colombian Government for this concession from October 31, 1904, to October 31, 1910?

Mr. CROMWELL. I respectfully decline to answer.

Senator MORGAN. You have already stated that they paid \$10,000,000 for it—I do not mean dollars, but francs; they paid a sum—I forget the precise sum—and yet after having stated that you decline to answer the question?

Mr. CROMWELL. I do not know when the application to which you refer was made. I know the extension was granted. That is a fact and a public record. I know the payment was made. That is a fact and a public record. That is the only reason I stated it.

Senator MORGAN. Was that subject pending before the Government of Colombia at the time of the date of this letter?

Mr. CROMWELL. I respectfully decline to answer.

Senator MORGAN. You refuse to answer?

Mr. CROMWELL. I do.

Senator MORGAN. Whether that subject was pending before the Government of Colombia at the date of that letter that you wrote to Mr. Hay?

Mr. CROMWELL. I do.

Senator MORGAN. You put that on the ground of professional confidence?

Mr. CROMWELL. I do.

Senator MORGAN. You know the fact, whether it was or not?

Mr. CROMWELL. I do not say whether I knew the fact or not.

Senator MORGAN. What is that?

Mr. CROMWELL. I have not said that I knew the fact.

Senator MORGAN. Well, do you know the fact?

Mr. CROMWELL. I decline to answer.

Senator MORGAN. Do you know when San Clemente took office in 1898?

Mr. CROMWELL. I do not.

Senator MORGAN. What month in the year?

Mr. CROMWELL. I do not, sir.

Senator MORGAN. Have you ever examined the Colombian statutes to see when the inauguration of the new President took place?

Mr. CROMWELL. No, sir.

Senator MORGAN. The year?

Mr. CROMWELL. No, sir.

Senator MORGAN. Do you know that it was in August of that same year that he took office, in virtue of an election?

Mr. CROMWELL. I do not.

Senator MORGAN. Do you know whether he had been elected five years before or twenty-five years before?

Mr. CROMWELL. I do not know when he was elected, nor the duration of his term.

Senator MORGAN. Did you know that he was in office at the time that you wrote that letter?

Mr. CROMWELL. Either he or Marroquin was in office. I have forgotten which, at the moment.

Senator MORGAN. The Vice-President could not be in office while the President was in office?

Mr. CROMWELL. I say either one or the other was in office.
Senator MORGAN. At that time?
Mr. CROMWELL. At that time.
Senator MORGAN. Who submitted that agreement with the Panama Canal Company to the Congress of Colombia?
Mr. CROMWELL. I respectfully decline to answer.
Senator MORGAN. It was submitted.
Mr. CROMWELL. You stated it so.
Senator MORGAN. What do you say about it?
Mr. CROMWELL. I decline to answer.
Senator MORGAN. But you have already informed Mr. Hay that it was submitted.
Mr. CROMWELL. The record speaks for itself. Senator.
Senator MORGAN. Is that your letter?
Mr. CROMWELL. It is.
Senator MORGAN. You wrote it?
Mr. CROMWELL. I did.
Senator MORGAN. Is it true?
Mr. CROMWELL. Well, Senator, you ought to have the courtesy, if you have not the judgment, to know that I would not write a letter that was not true.
Senator MORGAN. It is not that point, at all. I want to know whether you stated at that time what you knew to be the fact?
Mr. CROMWELL. I decline to be drawn into a discussion of my relations to my clients.
(By request, the stenographer repeated the pending question.)
Mr. CROMWELL. I repeat that I decline to be drawn into a discussion of business involving my clients.
Senator MORGAN. You refuse to answer the question?
Mr. CROMWELL. I do, sir, for the same reason.
(The committee thereupon adjourned until 10.30 o'clock to-morrow, Friday, March 2, 1906.)

(The following letter, which was referred to by Senator Morgan during the foregoing testimony, is, by direction of the committee, printed as part of the record:)

[Compagnie Nouvelle du Canal de Panama, 7 Rue Louis le Grand, Paris. Capital, 65,000,000 francs.]

PARIS, November 18, 1898.

TO THE PRESIDENT OF THE UNITED STATES.

SIR: The New Panama Company believes it to be its duty to respectfully submit the following statement:

It is common knowledge that in 1889 the Compagnie Universelle du Canal Interocéanique de Panama, the old company, fell into financial difficulties after about one-third of the canal had been finished. The rights of that company then passed judicial administration. A liquidator (receiver) was appointed by the judgment of the civil tribunal of the Seine under the date of the 4th of February, 1889. During his administration (1889-1894) and with the authorization of the court, the greatest care was taken to preserve and maintain the work already done, and a prolongation was obtained from the Republic of Colombia of the time stipulated for the completion of the canal, thus pre-

serving the rights of the company under its concession in their entirety.

In view of the advanced state of the work on the canal and the considerable sum (at least \$150,000,000) actually expended for canal work, properly so called, and for installations and plant, the logical conclusion follows that the very large capital invested would be protected through a reorganization of the affairs, which took place successfully in the month of October, 1894. At that time and with this object in view the undersigned company was organized under the general laws of France. The company is a commercial association, formed exclusively upon private capital, and has no connection, alliance, or relation whatever with any government, except the relations established by the concessions which it holds from the Republic of Colombia. The board of directors of the company is an entirely new board and composed of gentlemen of independent positions, having no official relation with the old Panama company, and for the most part identified with large financial and commercial enterprises.

Pursuant to judicial sale, authorized by the court as aforesaid, the undersigned company in 1894 became the sole owner of all the canal works, plant, material, concessions, and other property of the old company. The title of the undersigned to this property is therefore unquestionable, and has been officially recognized by the Government of Colombia.

Surveys had been made by the old company, but the new company, while making use of them, would not be bound by their conclusions. The board of directors resolved at the start to examine and study anew all the questions involved, making use of the most recent improvements in material and of the advances made in engineering.

It is needless for us to enumerate the difficulties and enormous expense involved in the choice of a definite plan for the execution of this work, which is one of the greatest undertakings of our time.

Different plans, equally practicable but varying in probable cost, have been studied. Many months have been spent in preparing, studying, and revising them. This work has not been done hastily and superficially. Engineers, chosen specially for their professional ability, have studied the question in all its details—technical, climatic, physical, geologic, and economic.

Though the skill of its own technical staff is worthy of the highest confidence, the undersigned company, out of abundant caution and in order to place beyond criticism the final conclusions, caused to be appointed an international technical commission, composed of engineers selected from different nationalities, a course which assures to the company the benefit of the widest possible experience, the severest judgment, and the most independent conclusions. The international technical commission is composed as follows:

M. Robaglia, president, inspector-general of roads and bridges (retired).

M. Bouvier, chairman, inspector-general of roads and bridges (retired).

General Abbot, United States Engineer Corps.

M. Castel, inspector-general of mines (retired).

M. Daymard, chief engineer of La Compagnie Transatlantique.

M. Fargue, inspector-general of roads and bridges (retired).

M. Fetley, chief engineer of the Croton Aqueduct, New York City.
M. Fulscher, private counselor to the minister of public works of Prussia, formerly technical director of the work of the Kiel Canal.

M. Hersent, civil engineer.

M. Hunter, chief engineer of the Manchester Canal.

M. Koch, councilor of public works of Germany; director of Technical Academy of Darmstadt; former member of the Imperial commission of the Kiel Canal.

M. Jules Martin, inspector-general of roads and bridges (retired).

M. Skaiskowski, formerly director of the department of mines to the minister of agriculture and lands of Russia.

M. Sosa, chief engineer, Colombia.

As to all statistical and economic questions, the new company established a special commission, presided over by M. Paul Leroy-Beaulieu, the eminent economist and a member of the Institute of France.

It is certain that the members of these two commissions are the most distinguished and able men in their profession. No one of them would compromise his reputation and his honor, acquired by a long life of eminent services, by formulating conclusions upon unfounded, incomplete, superficial, or uncertain information.

By the closest study of the subject; by actual inspection of the works of the canal, made by several of its members; by full discussion and by frequent exchange of views; by subjecting every problem to the critical judgment of all, thus obtaining the most varied opinions; by all the methods and with all the care which the most advanced technical experience could suggest, this eminent commission of engineers has reached a unanimous conclusion, which has been officially communicated to this company, and upon which this company is pursuing the work of construction.

These conclusions, signed by every member of the Commission, established the entire feasibility and practicability of completing the canal.

We do not doubt that you will be interested to learn the essential features of our plan, which have been prepared with so much labor and care and confirmed by four years of continuous study.

1. The old company had already substituted for the proposed sea-level canal a system of locks. This principle, with important modifications and improvements, has been adopted by the new company.

2. The length of the canal from ocean to ocean is 46 miles.

3. The locks will not exceed four on each slope of the divide; all locks will have a rock foundation, and all will have double-lock chambers.

4. There is nothing in the physical conditions on the Isthmus to prevent a change from a canal with a system of locks to a sea-level canal should the latter seem desirable in the future.

5. The time of passage from ocean to ocean will be less than a day.

6. The harbors situated at either extremity (Panama and Colon) are not artificial harbors; they are natural harbors, safe and satisfactory, needing but slight improvement. This fact is known to all the world, thanks to commerce, which for almost fifty years has made use of the Panama route (the Panama Railroad).

7. Two-fifths of the work on the canal has been actually constructed; the remaining three-fifths is in a fair way of completion.

During the last four years three or four thousand workmen on an average have been employed in working on the canal.

8. The company's concessions are unquestionable. The Republic of Colombia has given to the enterprise its cordial and sincere co-operation.

9. The existence and operation of the railroad, long established on the proposed line of the canal, greatly facilitates its construction.

10. No construction is planned which is not fully justified by practical experience. Formerly the greatest difficulties were (a) the control of the floods of the Chagres River and (b) the excavation of the Culebra cut.

The manner in which each of these difficulties is to be surmounted is shown with the greatest detail in the report of the technical commission, which we have the honor to present to you.

The condition of the new company is equally satisfactory. Its assets, including the work actually done on the canal, the buildings, the machinery, the material on hand, exceed in value 500,000,000 francs, or \$100,000,000, which valuation has been made by a special commission, of which the former director of the national academy of roads and bridges of France was chairman. The company has no mortgage or bonded indebtedness. The property is free from all incumbrance. The company has no other debts than monthly pay rolls. Its cash reserve is largely in excess of its actual needs.

The undersigned company also invites your attention to the provisions of this concession, particularly articles 5 and 6, which reserves all rights to the Government of the United States secured by the treaty with the Republic of Colombia signed in 1846 and ratified in 1848.

We have the honor to be, your obedient servants,

J. BONNARDEL,

The President of the Board of Directors.

Certified by the secretary of the company.

ED. LAMPRE.

ISTHMIAN CANAL.

COMMITTEE ON INTEROCEANIC CANALS,
UNITED STATES SENATE,
Washington, D. C., Friday, March 2, 1906.

The committee met at 10.30 o'clock a. m.

Present: Senators Millard (chairman), Kittredge, Dryden, Morgan, Ankeny, and Taliaferro.

TESTIMONY OF WILLIAM NELSON CROMWELL, ESQ.—Continued.

The CHAIRMAN. Mr. Cromwell, we are ready to proceed now.

Mr. CROMWELL. Senator Morgan, it may be of assistance if, in reply to your question on yesterday, I furnish you a more specific statement of the Panama coinage.

Senator MORGAN. Yes; read it, please.

Mr. CROMWELL. The monetary unit of the Republic is a gold coin called the "balboa," taking its name from Vasco Nuñez Balboa, the discoverer of the Panaman coast of the Pacific Ocean. It is a gold coin of 1 gram 672 milligrams (1.672) in weight, and of nine hundred thousandths fine, divisible into 100 cents.

No gold coinage has yet been issued by the Republic.

Silver coinage has been created by the Republic composed of nine hundred thousandths pure silver and one hundred thousandths of copper.

Senator MORGAN. Wait a moment. That balboa was never issued by any government?

Mr. CROMWELL. The balboa has not been issued, sir.

Senator MORGAN. By any government?

Mr. CROMWELL. By any government; no, sir.

Senator MORGAN. It is a mere statement of the unit?

Mr. CROMWELL. The gold unit; yes.

Senator MORGAN. Of fineness and weight?

Mr. CROMWELL. Yes; it is the gold unit. It may be issued at any time the Panama Republic desires.

Senator MORGAN. What does it stand for in our currency—how much?

Mr. CROMWELL. It is the equivalent of gold; it is a gold coin.

Senator MORGAN. No, no; how much in coinage does it stand for in our currency?

Mr. CROMWELL. One hundred cents.

Senator MORGAN. One hundred cents?

Mr. CROMWELL. Yes, sir.

Silver coinage has been created by the Republic, as I say, composed of nine hundred thousandths pure silver and one hundred thousandths of copper.

The nomenclature, weight, and diameter, and equivalent value of the silver coins are as follows:

The peso: A coin which shall weigh 25 grams, which shall have a diameter of 36 millimeters, and which shall be equivalent to fifty one-hundredths of a balboa.

The half peso: A coin which shall weigh 12½ grams, which shall have a diameter of 30 millimeters, and which shall be equivalent to twenty-five one-hundredths of a balboa.

The one-fifth peso: A coin which shall weigh 5 grams, which shall have a diameter of 24 millimeters, and which shall be equivalent to ten one-hundredths of a balboa.

The one-tenth peso: A coin which shall weigh 2½ grams, which shall have a diameter of 18 millimeters, and shall be equivalent to five one-hundredths of a balboa.

The one-twentieth peso: A coin which shall weigh 1¼ grams, which shall have a diameter of 10 millimeters, and which shall be equivalent to two and one-half one-hundredths of a balboa.

Consequently, 2 pesos of silver shall be equivalent to one balboa, which is the monetary unit. The fractions of a peso shall bear the same equivalent fractional proportion to the said unit.

Colombian coins of a standard not inferior to eight hundred and thirty-five thousandths fine and six hundred and sixty-six thousandths of the same alloy, which were in circulation in the Republic up to February 12, 1905, were exchanged for the national coins at the rate of 212½ pesos for each 100 balboas or their equivalent in Panama coins.

You asked me yesterday to put this in the record at some place. It is taken from the law.

I hand the committee, as it desired yesterday, a set of the Panama coins, which they may return to me when they have satisfied their use.

The CHAIRMAN. That will be considered as part of the record.

Senator KITTREDGE. When you say "a part of the record," you mean that you have no objection to the return of these coins to Mr. Cromwell after they have satisfied their use?

Senator MORGAN. No; I do not know that I have.

Senator KITTREDGE. As I understood him on yesterday, they have a special value.

Mr. CROMWELL. A historic value, being the first coins of the kind.

Senator KITTREDGE (continuing). Because of the fact that they were the first issued by the Panama Republic and presented to Mr. Cromwell. Is that right, Mr. Cromwell?

Mr. CROMWELL. Yes, sir.

The CHAIRMAN. I see no object the committee would have in retaining the coins, anyway. We can easily get a set.

Mr. CROMWELL. Oh, yes, yes; there is no trouble about that.

Senator MORGAN. It is a matter of very little interest to me. I am only trying to keep those people down there from being imposed upon, from being swindled, by having coins of the same size and different denominations put in circulation.

The CHAIRMAN. I understand that. We can get a set of them if we wish.

Senator MORGAN. On yesterday, Mr. Cromwell, I read you a letter from Mr. Bonnardel, president of the board of directors, dated the 18th of November, 1898, which has gone into the record. Previously there had been incorporated in the record your letter signed "William Nelson Cromwell, counsel, New Panama Company," addressed to Mr. Hay, Secretary of State, upon which I desire to ask you some questions. You declined on yesterday to state what was the inclosure in that letter. Do you still decline?

Mr. CROMWELL. The letter speaks for itself, Senator. I decline to make further comment upon it.

Senator MORGAN. That inclosure was a part of the letter?

Mr. CROMWELL. The letter speaks for itself, and I decline to make further comment upon it.

Senator MORGAN. Was that inclosure a part of that letter?

Mr. CROMWELL. The letter speaks for itself, and I must beg to be excused from further explanation.

Senator MORGAN. Do you remember the contents of that inclosure?

Mr. CROMWELL. The letter speaks for itself.

Senator MORGAN. No; the letter does not speak about your memory.

Mr. CROMWELL. I respectfully decline to go into the discussion of either the letter, its contents, or any inclosures.

Senator MORGAN. You decline, then, to state whether you recollect the contents of that inclosure?

Mr. CROMWELL. I do, sir; for the reason that it is part of my professional duty.

Senator MORGAN. To do what—to conceal everything that comes into your hands?

Mr. CROMWELL. It is part of my professional duty to observe the confidences of my client in the professional work in which I am engaged.

Senator MORGAN. Did you observe the confidence of your client in communicating that paper to the Secretary of State?

Mr. CROMWELL. It speaks for itself; it is a matter of public record.

Senator MORGAN. Well, but did you?

Mr. CROMWELL. It speaks for itself; it is a matter of public record.

Senator MORGAN. Mr. Cromwell, you may think that you are concealing the truth by these refusals, but you are not.

Mr. CROMWELL. I do not think anything of the kind; nor do I think that you are conducting your examination properly.

Senator MORGAN. Well, sir, I have the privilege, under the authority of the committee, to proceed until they check me. You may take exception to the form of my examination, you can appeal to the committee, but you can not decide it for me. Please remember that.

What decision of the Government of Panama is it that is included in the statement that I will read to you:

"Upon my return I learned through Director-General Hutin, who had preceded me to New York, that the measure which had just been acted on by one branch only of the Colombian Congress was a bill to authorize the Executive to negotiate the terms of and to conclude a further prorogation of six years from 1904 for the completion of the

canal, under a communication which the company had addressed to the Government, in the form of which I inclose you a translation."

What was the action of the Colombian Congress to which you referred?

Mr. CROMWELL. For the reasons stated, I respectfully decline to answer.

Senator MORGAN. You inclosed a translation, did you, of that order—that action?

Mr. CROMWELL. The letter speaks for itself, Senator. It is on the files of the State Department. You can get it if you want it, with any inclosures.

Senator MORGAN. I want your recollection of it, Mr. Cromwell.

Mr. CROMWELL. There is no secrecy about it.

Senator MORGAN. I want your recollection of it. State it.

Mr. CROMWELL. I decline to discuss the subject for the reasons I have stated.

Senator MORGAN. You decline, then, to state what was the translation that you sent to Mr. Hay of the paper referred to?

Mr. CROMWELL. I do. The public records will give you the information, if you want it.

Senator MORGAN. Do you not know that the Congress of Colombia rejected and refused to ratify the proposition made to it by the Panama Canal Company at that time for a prorogation or prolongation of the concession from October 31, 1904, to October 31, 1910?

Mr. CROMWELL. I decline to state for the reason given.

Senator MORGAN. Do you not know that personally?

Mr. CROMWELL. I decline to state for the reason given, sir.

Senator MORGAN. Is all your knowledge—your personal, outside knowledge, that you acquired as any other citizen—at the bidding of your company?

Mr. CROMWELL. I decline to answer further than I have answered.

Senator MORGAN (reading). "You will note that the company specifically stated to the Government that the prorogation was not a matter of absolute necessity, but was desirable in the interests of commerce and navigation to enable an even deeper cut to be made and which would reduce the number of locks to four, but which reduction would, of course, require more time than the plan adopted."

What did you mean by a cut there?

Mr. CROMWELL. I decline to discuss the subject for the reason I have stated.

Senator MORGAN. You propose, then, to be merely recalcitrant?

Mr. CROMWELL. I propose to adhere to the professional obligation which I possess.

Senator MORGAN. Was it professional obligation that caused you to write this letter to Mr. Hay?

Mr. CROMWELL. It was.

Senator MORGAN. Was Mr. Hay also bound to keep it secret?

Mr. CROMWELL. I can not answer that question.

Senator MORGAN. Was it a confidence you gave to Mr. Hay?

Mr. CROMWELL. No, sir; it was a public and official communication, which you can get from the State Department if you will take the trouble to do it.

Senator MORGAN. If there was any confidence of a professional sort about it, then, you broke it?

Mr. CROMWELL. I did not break it.

Senator MORGAN. Then it did not exist?

Mr. CROMWELL. It did exist; the confidence exists.

Senator MORGAN. Well, you made the statement. If the confidence existed, so that you can not now reveal it to the committee of the Senate, why did it not exist at the time that you revealed it to the Secretary of State?

Mr. CROMWELL. Senator, my answer is complete and should be convincing to you that any reference by way of explanation or exposition of any correspondence that I have had is professional. The fact of the correspondence is official is true; it is on the record; you can get it. There you should get it.

Senator MORGAN. I accept your advice and your instruction on that subject, but decline to follow it.

Mr. CROMWELL. If you would follow that suggestion, you would save yourself and all of us a great deal of bother.

Senator MORGAN. Yes; I am aware that I would save you some bother, but I am not here for that purpose.

Mr. CROMWELL. I do not mind the bother.

Senator MORGAN. You seem to take it very much to heart.

Mr. CROMWELL. Not at all to heart.

Senator MORGAN. You further say to Mr. Hay: "You will note that the bill proposed to confer power upon the Executive, and this happened to arise under extraordinary political conditions in Bogota." What were they?

Mr. CROMWELL. I decline to state, for the reasons I have mentioned.

Senator MORGAN. Are extraordinary political conditions in Bogota part of your professional confidences with your company?

Mr. CROMWELL. Any information I acquired is within the scope of that duty.

Senator MORGAN. So that if the Panama Canal Company had employed you to do any work that was contrary to the welfare and interests of the United States, you would feel that you would be obliged to conceal it?

Mr. CROMWELL. I decline to answer such hypothetical and impertinent questions.

Senator MORGAN. Hypothetical and impertinent, both?

Mr. CROMWELL. Both.

Senator MORGAN. Well, I have to submit to your very unusual and indecent interruptions, because the committee seems to be disposed to compel me to.

Mr. CROMWELL. It is no more unusual or indecent than yours.

(At the request of Senator Taliaferro, the stenographer read as follows:)

"So that if the Panama Canal Company had employed you to do any work that was contrary to the welfare and interests of the United States, you would feel that you would be obliged to conceal it?"

Senator TALIAFERRO. What is there impertinent in that question, Mr. Cromwell?

Mr. CROMWELL. The assumption that I was employed by the canal company to do anything against the interests of the United States.

Senator TALIAFERRO. Where is the assumption? It is a question, as I understand.

Mr. CROMWELL. In the question, sir.

Senator TALIAFERRO. I submit to the committee, Mr. Chairman, that this witness shall be required to answer these questions in a respectful manner.

The CHAIRMAN. I think the witness went out of the way there to make that answer. It was not a proper answer to make, and I hope he will not do it again.

Senator KITTREDGE. May I make a suggestion in this connection?

The CHAIRMAN. Yes, sir.

Senator KITTREDGE. It is that the questions of the Senator should be couched in different language.

Senator TALIAFERRO. If there is any objection, Mr. Chairman, to a question put by a Senator, any member of this committee has a right to object to it at the time.

The CHAIRMAN. I do not think Senator Morgan's question was of such a kind that it should have brought forth just the answer that the witness gave, and I hope we will not have it again in that way.

Senator TALIAFERRO. This is not the first time that I have noticed the witness's disposition to be insulting to the Senator, and I do not propose, as a member of this committee, to submit to it.

Senator MORGAN. I beg to say to the committee that I have no personal resentment to any affront or insult that Mr. Cromwell tries to throw upon me. I have more self-respect than to indulge in any such sentiments.

The CHAIRMAN. Proceed, Senator Morgan, please.

Senator MORGAN. I will read that entire paragraph again, so as to get the precise language of it (reading):

"You will note that this bill proposed to confer power upon the Executive, and this happened to arise under extraordinary political conditions in Bogota. As you have probably been advised through official channels, a serious difference has recently been existing between the House of Representatives of Colombia and the President, the House having passed formal resolutions declaring the office of President vacant and refusing to recognize the qualification of the President before the supreme court."

Did you get that statement that you made to Mr. Hay as a professional confidence from the New Panama Canal Company?

Mr. CROMWELL. It is embraced, sir, within the scope of my professional duty.

Senator MORGAN. You revealed it to Mr. Hay; you decline to reveal it again to the committee?

Mr. CROMWELL. It is revealed in the letter, Senator.

Senator MORGAN. Very good. Do you decline to state now, as a fact within your knowledge at that time, that the House had refused to recognize the qualification of the President before the supreme court, and that they had declared his office vacant?

Mr. CROMWELL. I decline to make further discussion of the letter, Senator, because the letter explains itself.

Senator MORGAN. Is that a professional confidence, that you shall not make a further explanation of this letter?

Mr. CROMWELL. Yes, sir.

Senator MORGAN. It is?

Mr. CROMWELL. It is.

Senator MORGAN. You swear to that?

Mr. CROMWELL. I do.

Senator MORGAN. In what part of your duties as attorney was that professional confidence provided for?

Mr. CROMWELL. Within the general scope of my professional duties, sir.

Senator MORGAN. What was that?

Mr. CROMWELL. I can describe it no more particularly than that.

Senator MORGAN (reading): "We therefore construe the action of the House of Representatives as only a part of the strife between the House and the President, and not a declaration of the policy of the nation or the Congress in respect of the Panama Canal, and as not evidencing hostility to the company itself."

On what basis did you make that construction?

Mr. CROMWELL. I have to repeat my former answer, Senator.

Senator MORGAN. You do not have to do it unless you want to swear to it.

Mr. CROMWELL. I beg your pardon. I mean I do repeat my former answer.

Senator MORGAN. And you therefore decline to inform the committee the basis of fact upon which you made that statement to Mr. Hay?

Mr. CROMWELL. I do, sir, respectfully, for the reasons given.

Senator MORGAN (reading). "Our company has not the least apprehension regarding any prorogation of its concessions it may consider necessary in the future."

What removed your apprehensions in regard to the prorogation of its concessions?

Mr. CROMWELL. I make the same reply, Senator.

Senator MORGAN. If the Panama Canal Company has, through its secretary, Mr. Lampré—you know Mr. Lampré, do you?

Mr. CROMWELL. Yes, sir.

Senator MORGAN (continuing). If that company has, through Mr. Lampré, uncovered this whole subject in his deposition before this committee on a previous occasion, do you still feel bound to withhold all information you possess in regard to the same subject?

Mr. CROMWELL. I do, Senator.

Senator MORGAN. Well, I will read that to you, or I will get my friend on my right here to read it, because I am in quite a poor condition of health this morning. Just read it right along, question and answer, right through.

(Senator Taliaferro, as requested, thereupon read as follows:)

"The examination of Mr. Lampré then went on, as follows:

"The CHAIRMAN. Now, Mr. Lampré, that letter to the President of the United States does not contain any proposition?

"M. LAMPRÉ. No; not at that time; no, sir.

"The CHAIRMAN. Why was it written?

"M. LAMPRÉ. Because, to my recollection, it was contemplated at the time that something ought to be done in the way of a reorganization of the company. It appeared at the time that the Nicaragua concession was under discussion; that the rivalry of such a canal might be a great danger to the Panama Canal, and we thought at the time, as far as I can remember—it is rather old, it is three years ago—we thought at the time that we had to lay the whole subject before the President in order to ascertain and to see under what conditions we might, if necessary, Americanize our corporation and build

the canal in partnership with the American interests. That is my recollection.

Senator MORGAN. One minute. You observe that the words "Americanize the corporation" are there. Was that paper that was read to you the other day, containing a statement of what had taken place by the Panama Canal Company in regard to the Americanization of the canal, the result of the action spoken of there?

Mr. CROMWELL. I do not know, Senator.

Senator MORGAN. You have no information on that subject?

Mr. CROMWELL. No, sir.

Senator MORGAN. Although the paper handed to you recites it?

Mr. CROMWELL. It recites a different subject, sir.

Senator MORGAN. Sir?

Mr. CROMWELL. It recites a different subject at a different time.

Senator MORGAN. A different subject at a different time?

Mr. CROMWELL. Yes, sir.

Senator MORGAN. Read on, if you please.

(Senator Taliaferro, as requested, read as follows:)

"The CHAIRMAN. With the American Government?

"Mr. LAMPRÉ. Well, I suppose private or public American interests. I think at the time it was contemplated to have a private corporation.

"The CHAIRMAN. You had money enough then at hand or in prospect to build the canal?

"Mr. LAMPRÉ. We had not in cash money enough.

"The CHAIRMAN. You had good credit, though?

"Mr. LAMPRÉ. Yes; I think we had, but still—

"The CHAIRMAN. You were confident, then, that you could complete the canal?

"Mr. LAMPRÉ. We were confident; but still, as you know, there was the rivalry of the Nicaragua Canal.

"The CHAIRMAN. And it was the rivalry of the Nicaragua route that caused this paper to be printed?

"Mr. LAMPRÉ. Yes, sir; exactly.

"The CHAIRMAN. Was it argued at the time the letter was written that the United States was about to take or had taken action in favor of the Nicaragua route?

"M. LAMPRÉ. I forget whether it was at that time.

"The CHAIRMAN. We can ascertain that by a reference. Was this letter discussed and the authority given to send it to the President at a meeting of the board of directors of the New Panama Canal Company?

"M. LAMPRÉ. Yes; it is in accordance with the resolution of the board.

"The CHAIRMAN. The letter says that the board of directors is composed of gentlemen in an independent position.

"M. LAMPRÉ. Yes, sir.

"The CHAIRMAN. They must have been interested in and identified with large affairs in Paris.

"M. LAMPRÉ. So they were, and are still at the present time.

"The CHAIRMAN. Of a financial character?

"M. LAMPRÉ. Yes, sir.

"The CHAIRMAN. Was it not the fact that the new board was composed of gentlemen who took over the property on speculation?

"M. LAMPRÉ. At the time or now?

"The CHAIRMAN. At the time it was consummated.

"M. LAMPRÉ. For speculation? No, sir.

"The CHAIRMAN. They took it over with the intention of completing the canal?

"M. LAMPRÉ. Quite so. They were honest and straightforward in the intention. I must be positive on the subject.

"The CHAIRMAN. They are still able to do it, are they not?

"M. LAMPRÉ. Oh, yes, sir.

"The CHAIRMAN. The French people are still able to do it?

"Mr. LAMPRÉ. They might.

"The CHAIRMAN. They paid the indemnity to Germany without any trouble, and we thought that the most marvelous act ever performed.

"M. LAMPRÉ. I think we have enough cash in France.

"The CHAIRMAN. You have plenty there to do it?

"M. LAMPRÉ. Yes, sir.

"The CHAIRMAN. Why are you trying to sell this canal enterprise for \$40,000,000 when your people are able to build it and have so much involved in it?

"M. LAMPRÉ. That is quite a different question, in my opinion. We have plenty of cash in France to build it, but the rivalry with the Nicaragua route and the possibility of the Congress of the United States passing a resolution for the construction of the Nicaragua Canal has frightened the people there, and so we thought it best to seek some kind of a combination here to build the canal, then with the assistance of the United States, and now to let the canal go to the United States if they will have it.

"The CHAIRMAN. Your first proposition was to build the canal and realize out of it what you expected to do?

"M. LAMPRÉ. Exactly.

"The CHAIRMAN. That was your first idea?

"M. LAMPRÉ. Exactly.

"The CHAIRMAN. That was the idea on which that letter was written?

"M. LAMPRÉ. Exactly, sir.

"The CHAIRMAN. Then if you could not do that, to prevent the building of it on the Nicaragua route?

"M. LAMPRÉ. We did not intend preventing anything, but we thought the Panama route in our opinion the best.

"The CHAIRMAN. Was it not the purpose of this movement to compel the United States to build on your ground or not build at all?

"M. LAMPRÉ. To compel?

"The CHAIRMAN. Yes.

"M. LAMPRÉ. We had no mind to compel anybody.

"The CHAIRMAN. I do not mean by force of arms.

"M. LAMPRÉ. Our opinion was that the United States Government, or Congress, passing upon a resolution for the construction of the Nicaragua Canal would place us in great difficulty to raise the money in France. So we thought that we might as well lay the whole subject before the United States.

"Senator MITCHELL. May I ask a question right there?

"The CHAIRMAN. Certainly.

"Senator MITCHELL. Suppose the United States should decline the offer which has been made by your company, and suppose, furthermore, Congress should go on and authorize the construction of the Nicaragua Canal, do you think that the Panama Canal would then be completed?

"M. LAMPRÉ. It might be.

"Senator MITCHELL. What is your best judgment on that point? What is your opinion?

"M. LAMPRÉ. It might be. We might raise the money still in France.

"The CHAIRMAN. Just in that connection I will ask you if you have made efforts to raise money in France to complete the canal?

"M. LAMPRÉ. No; for we have no bondholders and not any bonded indebtedness at all.

"The CHAIRMAN. I do not mean that. Have you asked for subscriptions?

"M. LAMPRÉ. No; we have not.

"The CHAIRMAN. You have not invited the French people to subscribe at all?

"M. LAMPRÉ. No; we have not, because we thought it best, under the circumstances, not to go before the public, being given the possibility of the construction of the Nicaragua Canal by the United States.

"The CHAIRMAN. In this letter to the President it is stated that the assets of the company exceed in value \$100,000,000.

"M. LAMPRÉ. Yes, sir.

"The CHAIRMAN. That the property is free from incumbrance; that the title is unquestionable; that the company has no other debts than the monthly pay rolls; that it has no mortgages or bonded indebtedness, and its cash reserve is largely in excess of its actual needs.

"M. LAMPRÉ. Yes, sir.

"The CHAIRMAN. So this statement of the great strength and confidence of the Panama Canal Company was sent to the President to inspire him with like confidence in the success of the Panama Canal and to convince him and Congress and our people that it would be a fatal competition to the Nicaragua Canal.

"M. LAMPRÉ. Well, I do not know, sir. I do not know what was at the time in the mind of the board. I can not answer that question. I do not know what they aimed at. I think it was only putting the whole subject before the President in the light in which it stood and showing how it stood.

"The CHAIRMAN. Or was it the purpose then to prepare the United States to become the purchasers of the Panama Canal?

"M. LAMPRÉ. At that time?

"The CHAIRMAN. At that time.

"M. LAMPRÉ. I do not know at the time what it was.

"The CHAIRMAN. You do not know when that idea originated?

"M. LAMPRÉ. No.

"The CHAIRMAN. What was the actual purpose and object of the letter to the President of the United States and the letters and telegrams to Cromwell, attorney, given with the message of the President of February 20, 1900? What was the actual purpose and object

of the letter to the President of the United States of the 18th day of November, 1898?

"M. LAMPRÉ. As far as I can recollect, the purpose was to lay the whole subject before the United States, and at the time we stated that should the United States abandon the idea of constructing the Nicaragua Canal we were ready to reorganize under the laws of this country and to organize an American corporation to complete the Panama Canal, which we thought the best route, and still think the best route. That is why we laid the whole subject before the United States at the time.

"The CHAIRMAN. In addition to this cheerful picture of the resources of the company, these letters boast of the conciliation of Colombia and that the entire feasibility and practicability of completing the canal is established by the members of two commissions who were the most distinguished men in their professions. Why did not a canal that was so well fortified in its appeal to public confidence obtain the money to complete it by subscriptions among the French people, who had already sunk \$250,000,000 in it and only had the ditch, the buildings, the machinery, and the material on hand to show for this expenditure?

"M. LAMPRÉ. Just as I told you, Senator, on account of the contemplated building by the United States of the Nicaragua Canal."

Senator MORGAN. Do you know anything at all of the transaction mentioned by Mr. Lampré in his testimony?

Mr. CROMWELL. Of what transaction, Senator?

Senator MORGAN. That which has just been read.

Mr. CROMWELL. The word "transaction" that you employ is a little uncertain to me, that is all.

Senator MORGAN. Well, do you know anything of the matter contained in the statement of Mr. Lampré which has just been read?

Mr. CROMWELL. As it is involved in the general scope of my professional duty, I must beg to be excused from further explanation.

Senator MORGAN. Here, then, Mr. Cromwell, is the secretary of the company under oath before this committee disclosing these facts. Do you pretend to have a professional confidence with that company that prevents you from making a statement in regard to those facts?

Mr. CROMWELL. The secretary had no such obligation. He was the secretary of the company and disclosed the facts, as he had a right to do and did do. That does not affect my duty.

Senator MORGAN. The secretary, then, you state, had the right to disclose them because he was not under a professional obligation?

Mr. CROMWELL. Yes, sir.

Senator MORGAN. You were not the counsel of the Panama Canal Company in France, as you have stated here under oath two or three times?

Mr. CROMWELL. I was not their general counsel in France, although when I visited there almost annually I advised them in my professional capacity, of course.

Senator MORGAN. Not being the counsel of the company in France, and this disclosure having been made on oath by the secretary of the company, do you still insist that your professional relations to the Panama Company compel you to refuse to make any statement in regard to the statement Mr. Lampré has made before this committee and which has just been read in your hearing?

Mr. CROMWELL. I do, Senator; because my relations are entirely distinct from those of Mr. Lampré.

Senator MORGAN. What is the distinction?

Mr. CROMWELL. He is the secretary of the company, an officer of the company, and gave his testimony fully. My relation is entirely different, sir.

Senator MORGAN. Mr. Lampré states here, in respect of why the letter was written:

"Because, to my recollection, it was contemplated at the time that something ought to be done in the way of reorganization of the company. It appeared at the time that the Nicaragua concession was under discussion, that the rivalry of such a canal might be a great danger to the Panama Canal; and we thought at the time, as far as I can remember—it is rather old, it is three years ago—we thought at the time that we had to lay the whole subject before the President in order to ascertain and to see under what conditions we might, if necessary, Americanize our corporation and build the canal in partnership with the American interests."

Do you not know, as a matter of fact contained in the records of the Panama Canal Company in Paris, that a resolution was entered into by them to carry into effect this project of the Americanization of the canal?

Mr. CROMWELL. Whatever information I have upon the subject, Senator, is comprised within the scope of my professional duty.

Senator MORGAN. Are the records and your knowledge of the records in Paris a matter of professional secrecy?

Mr. CROMWELL. A matter of professional secrecy, Senator.

Senator MORGAN. Confidence?

Mr. CROMWELL. Yes, sir.

Senator MORGAN. Did you not know, and do you not now know, that that company came to the resolution that that canal was to be Americanized if practicable?

Mr. CROMWELL. I repeat my answer, Senator.

Senator MORGAN. Do you contradict anything that Mr. Lampré has stated in his sworn testimony before this committee?

Mr. CROMWELL. I am not at liberty to speak about it, sir.

Senator MORGAN. You can not even talk about it?

Mr. CROMWELL. No, sir; I can not. I mean that with no disrespect to you, of course.

Senator MORGAN. Well, your lockjaw is getting even more and more aggravated. Do you know whether that resolution of that company was ever communicated to the Government of Colombia?

Mr. CROMWELL. I have no knowledge on the subject, sir.

Senator MORGAN. Did you ever communicate it?

Mr. CROMWELL. I am quite uncertain, but if I had I would be unable to speak about it, because it would be within my professional duty; but, in frankness, I have no memory about it.

Senator MORGAN. You have stated that the canal company had an agent and kept an agent continuously at Bogota, and was required to do so by the terms of its concession?

Mr. CROMWELL. Yes, sir. That was an official agent, you know.

Senator MORGAN. Yes—an official agent. Would the communication of this action of the company go through that agent or through you?

Mr. CROMWELL. I do not know, sir. I know it did not go through me, sir; but I have no information as to any other source.

Senator MORGAN. According to the terms of your employment in Colombia, would it go through you or go through him to the Colombian Government—through this agent I am speaking of?

Mr. CROMWELL. I merely know it did not go through me. I do not know anything about it, Senator.

Senator MORGAN. Do you not know that the Government of Colombia was never notified or informed in any way of that action of the company?

Mr. CROMWELL. I know nothing about the subject, Senator.

Senator MORGAN. Do you not know that it was particularly guarded, so that that information should not be carried to the Government of Colombia?

Mr. CROMWELL. I do not know, sir.

Senator MORGAN. The plan that Mr. Lampré has revealed here was to take the canal out of the reach of Colombia, Americanize it, and make it an American institution. Do you know of any plan or project on the part of the canal company to carry that into effect?

Mr. CROMWELL. I beg to be excused, Senator, for the reasons I have stated.

Senator MORGAN. Excused from what?

Mr. CROMWELL. From discussion of the subject.

(By request, the stenographer read aloud the pending question, as follows:)

"The plan that Mr. Lampré revealed here was to take the canal out of the reach of Colombia, Americanize it, and make it an American institution. Do you know of any plan or project on the part of the canal company to carry that into effect?"

Senator MORGAN. What is your answer?

Mr. CROMWELL. My answer is the same—that my professional relations would prohibit me from discussion of it, Senator.

Senator MORGAN. I will ask you whether that paper that was read in your hearing the other day, and that has gone into the record of the committee, the record of this examination, which recited the fact that you had been exclusively intrusted with the execution of the plan for the Americanization of the canal—whether that instrument, just prepared, and prepared by you, was intended to execute that order of the canal company?

Mr. CROMWELL. I decline to answer for the same reasons, sir.

Senator MORGAN. Have you any knowledge on the subject?

Mr. CROMWELL. I decline to state, sir, for the same reason.

Senator MORGAN. You decline to state whether you have any knowledge on the subject?

Mr. CROMWELL. Yes, sir; I mean I decline to discuss the subject, which involves my client's relations.

Senator MORGAN. Did you not prepare that paper under a contract with the French company—the Panama Canal Company—with you individually, giving you the exclusive right to control that subject in the United States? And did you not submit it to different persons in the United States?

Mr. CROMWELL. I have already answered that question the other day; and I beg leave to repeat it, sir, with the greatest respect to yourself.

Senator MORGAN. That contract confers upon Nelson G. Cromwell exclusive privileges and large remuneration for carrying a plan into effect. Was that the same plan of which Lampré was speaking?

Mr. CROMWELL. What was the date of Mr. Lampré's testimony, Senator?

Senator MORGAN. The date of his testimony? I can not conveniently refer to the date of it just now. It is in the hearings.

Senator KITTREDGE. I think it was January, 1902.

Senator MORGAN. Have you the hearings there?

Senator KITTREDGE. No; I am speaking from recollection. I think it was January, 1902.

Senator MORGAN. That is my remembrance, too, about the date.

(By direction, the stenographer read aloud the pending question, as follows:)

"That contract confers upon Nelson G. Cromwell exclusive privileges and large remuneration for carrying a plan into effect. Was that the same plan of which Lampré was speaking?"

Mr. CROMWELL. I beg to be excused from a discussion of the subject, which involves—

Senator MORGAN. Well, I can not excuse you. Do you refuse?

Mr. CROMWELL. I do refuse, Senator, for the reasons stated.

Senator MORGAN. A while ago, in your testimony, you spoke about this same matter to which I have just referred, and said that what Lampré was speaking of referred to a different matter from this paper of yours about the Americanization of the canal. What different matter was it?

Mr. CROMWELL. My impression was that that related to the proposal that had been made to the Committee on Rivers and Harbors of the House of Representatives, in which it was proposed to Americanize the company.

Senator MORGAN. What proposition was that? Who made that proposition?

Mr. CROMWELL. That was made by the New Panama Canal Company, through its president and myself.

Senator MORGAN. Were you present at the time?

Mr. CROMWELL. Yes, sir.

Senator MORGAN. Did you assist in it?

Mr. CROMWELL. Yes, sir.

Senator MORGAN. That was a plan for the Americanization of the canal?

Mr. CROMWELL. Yes, sir. That was a proposal of a plan. It is on record.

Senator MORGAN. You proposed that to the committee of the House?

Mr. CROMWELL. Yes, sir; it is in the record.

Senator MORGAN. In what did that differ from this plan I have called your attention to and have recited in the record?

Mr. CROMWELL. I can not, Senator, enter into a description and definition of the differences, because that of itself involves the relations to my clients, that is all. I referred to the naked fact that such a proposal was made.

Senator MORGAN. The difference between the two plans involves the confidential relations between you and your clients?

Mr. CROMWELL. Yes, sir; it does.

Senator MORGAN. How can we determine that unless you state what the differences were? This committee will shield you if you are entitled to protection.

Mr. CROMWELL. I can answer no more definitely, Senator. I am trying to aid you all I can within the scope of my duties.

Senator MORGAN. There were two plans there? There were two plans?

Mr. CROMWELL. Yes, sir; there were two suggestions of that character.

Senator MORGAN. Which was the first one?

Mr. CROMWELL. The first one was before the House committee.

Senator MORGAN. Which was the second one?

Mr. CROMWELL. The second one you have alluded to in the testimony here.

Senator MORGAN. That is a rather imperfect description. Get a little closer to it. Describe the second one.

Mr. CROMWELL. The second allusion to any Americanization is that to which you have referred.

Senator TALIAFERRO. He has referred to both, Mr. Cromwell. That is the reason he is pressing his question.

Senator MORGAN. You have described one by mentioning it, I believe—I so understood you—as being the plan that was described by Mr. Lampré, and you have said there was another. Now, I want you to describe the other one.

Mr. CROMWELL. I have said that any other plan, which was by way of a *projet*, is that to which you have alluded yourself in this examination here.

Senator MORGAN. You mentioned that that was not the plan that Lampré referred to, as I understood you, that was presented in that paper that I presented to you the other day; but was this plan that you have stated was the one that was made to the committee of the House?

Mr. CROMWELL. I am not distinct in my memory about it, Senator. It is several years old.

Senator MORGAN. I was trying to refresh your memory by reading Lampré's deposition. You state that the plan that he refers to here was not the plan that you had been questioned about before?

Mr. CROMWELL. I frankly am not distinct in my memory about the two subjects.

Senator MORGAN. I am trying to refresh it by bringing the paper to you and reading it to you, and you refused to make any statement about that paper at all?

Mr. CROMWELL. Yes, sir.

Senator MORGAN. Is that the paper in regard to which you refused to make a statement?

Mr. CROMWELL. Yes, sir.

Senator MORGAN. So there was a paper about which you refused to make a statement. Now, what was that paper?

Mr. CROMWELL. The paper you have already presented, Senator.

Senator MORGAN. The paper that I presented here and carried into the record?

Mr. CROMWELL. Yes, sir.

Senator MORGAN. So you admit, then, that there was such a paper?

Mr. CROMWELL. I do not admit the paper in the sense of an admission.

Senator MORGAN. Well, why do you state it, then—just because you can not get out of it?

Mr. CROMWELL. Because it is a fact; just because you have mentioned it, and I am referring to the topic to which you allude.

Senator MORGAN. Well, I will assume, on the facts you have stated, that there were two papers, and that Mr. Lampré has described one of them in a sense, to a certain extent, and that the other, so far as you are concerned, has received no identification or description. Now, I want you, from the best of your recollection, to describe that other paper which Mr. Lampré did not describe.

Mr. CROMWELL. I respectfully decline, Senator, for the reasons I have stated.

Senator MORGAN. You will not answer that question?

Mr. CROMWELL. For the reasons I have stated, sir.

Senator MORGAN. You refuse to answer the question?

Mr. CROMWELL. For the reasons I have stated, I do refuse, Senator.

Senator TALIAFERRO. Mr. Chairman, I would like to ascertain if this witness shall be allowed to testify before this committee that there was a plan submitted to the Committee on Rivers and Harbors of the House of Representatives to Americanize that canal, and then refuse to state what the plan was. In other words, if, in stating that there was a plan submitted to which he was a party, he has now the right to refuse to state what the plan was, on the ground that it involves confidential relations to his clients.

The CHAIRMAN. Do you wish action taken on that by the committee?

Senator TALIAFERRO. I will reserve it, and take it up in executive session. I merely wish to call attention to the fact that I wish to take it up.

The CHAIRMAN. We will take it up later, then.

Senator DRYDEN. Was this plan submitted to a committee of the House of Representatives?

Senator TALIAFERRO. He states in his testimony that it was.

Mr. CROMWELL. It was, Senator.

The CHAIRMAN. Proceed, Senator Morgan.

Senator MORGAN. Was it in writing?

Mr. CROMWELL. It was, Senator; and I will be happy to furnish you a copy of it, of the record here. It was in writing, and is self-explanatory. It is a part of the records of Congress, and is open to everybody.

Senator TALIAFERRO. The committee has the right, as I esteem it, as I regard it, to get its information in its own way.

Mr. CROMWELL. Yes, sir.

Senator TALIAFERRO. And you have not the choice as a witness (I submit, Mr. Chairman) of dictating to this committee how it shall obtain its information.

Mr. CROMWELL. That is quite right, sir; and therefore I say, Senator, that I will furnish a copy of that proposal.

Senator TALIAFERRO. And therefore I say, Mr. Cromwell, that I as a member of this committee do not desire the information in that way,

but I desire the questions of the Senator answered in your own language rather than by a written statement.

Mr. CROMWELL. I have no present recollection of the precise terms, Senator, of that proposal made to the House committee; but it was in effect this: That the New Panama Canal Company was aware of the sentiment in the United States in favor of an American corporation, and that if it was the desire of the United States Government that the New Panama Canal Company should become Americanized, should become an American corporation, the New Panama Canal Company would consummate that plan and would accord to the United States representation in that corporation without any investment by the United States Government in that regard. That, sir, is the substance of the proposal or suggestion that was made to the Rivers and Harbors Committee, officially, by the then general manager of the New Panama Canal Company, approved by myself as general counsel.

Senator MORGAN. I would be very glad, Mr. Chairman, I will say to my colleague, if the question of the determination of what shall be the action of the committee upon the Senator's motion can go over until to-morrow morning. I understand Mr. Markel is to be examined this afternoon.

The CHAIRMAN. Yes; Mr. Markel is to come at 2 o'clock. So it will go over, as suggested, until to-morrow morning.

Senator MORGAN. It will oblige me to take that course. We will consider that question continued, then.

The CHAIRMAN. Yes, sir.

Senator TALIAFERRO. Mr. Chairman, I wish to say, for the benefit of the witness, that if he desires, before undertaking to answer the question of the Senator, to have this paper in writing before him to refresh his memory, I have no objection to his taking time to obtain it.

Mr. CROMWELL. Thank you, Senator; I shall do so.

Senator DRYDEN. Mr. Chairman, has not the witness just answered this question?

The CHAIRMAN. As I understand it, he has answered it to Senator Taliaferro, but he has refused to answer it to Senator Morgan.

Senator TALIAFERRO. He has not answered it fully, and I have no objection to his getting the written statement and to answering the Senator's question fully with that statement before him.

Mr. CROMWELL. Yes, sir.

Senator MORGAN. Mr. Cromwell, were either of these plans, within your knowledge, conveyed to the Government of Colombia?

Mr. CROMWELL. I have no knowledge on the subject, Senator.

Senator MORGAN. Could they have been conveyed to the Government of Colombia without your knowing it?

Mr. CROMWELL. That may be.

Senator MORGAN. Through what channel?

Mr. CROMWELL. The corporation itself might have done so.

Senator MORGAN. Do you not know that it was not conveyed to the Government of Colombia?

Mr. CROMWELL. I do not know that it was conveyed, Senator. I have no knowledge of its having been done.

Senator MORGAN. Well, do you not know that it was never conveyed?

Mr. CROMWELL. I know it was never conveyed through me, sir.

Senator MORGAN. Or from anybody else?

Mr. CROMWELL. Or from anybody else that I know of.

Senator MORGAN. Yes. Now, the Government of Colombia, as early as April 20, 1900, had gotten into a civil war. You are aware of that fact, are you?

Mr. CROMWELL. From general information; yes, sir. I am taking your date, Senator. I have nothing in my memory to make it very exact.

Senator MORGAN. That civil war began during the Presidency of Sanclemente and was continued during the Presidency of Marroquin, who took his place when he was removed from office?

Mr. CROMWELL. I suppose that is a historical fact.

Senator MORGAN. That is a historical fact. I want to read to you, or get my friend to read to you, the manifesto of certain Colombians, one of whom is G. Vargas Santos, and the other is Focion Soto, first asking you whether either or both of those men were the leaders of what was called the Liberal party that was at war with the Government party?

Mr. CROMWELL. I do not know, Senator, the status of the politics.

Senator MORGAN. You have no knowledge of it?

Mr. CROMWELL. No; except that there were two parties. Their names and their leaders would not have any significance to me.

Senator MORGAN. Yes. Well, I will get the Senator to read this, so that I may base some questions upon it.

(As requested, Senator Taliaferro thereupon read as follows:)

“ THE PANAMA CANAL—MANIFESTO.

“ Motives that are both legitimate and noble have prompted the Liberal party of Colombia to take up arms in order to insure to the country freedom, to establish a régime that will guarantee the progress and very existence of the Republic, which are to-day threatened by institutions not framed nor sanctioned by the people, and by functionaries who have received their authority through absolute disregard of, and violent opposition to, the will and opinion of the majority of citizens.

“ Both nature and tradition have impelled the patriotic people of Colombia to rebel against a condition of things in which they are prevented, de jure as well as de facto, from exercising their legitimate, natural rights; in which a great party has been deprived of its political freedom, and in which the pacific development of the country has been arrested. It is only after exhausting all peaceable means that war has been resorted to as a last and extreme measure—a dire measure—but one dictated and imposed by necessity.

“ The men that are to-day struggling to recover their rights constitute the Liberal party and form the great majority of the Colombian people. Anyone who compares the condition, both civil and political, of our people under the system of government that existed in this country for nearly half a century with the conditions created by the so-called regeneration system will no longer take that attitude of contemptuous commiseration with which our civil wars are often regarded by people who have already attained that liberty and security after which we are still striving, and he will under-

stand the significance of the present revolutionary movement, which already begins to put an end forever, we hope, to the oppressive government imposed on our unfortunate country.

"We, the undersigned, have the honor of being the authorized representatives of the Liberal party, and therefore of the Colombian people; and the following statements and declarations being the faithful expression of the country's will, through the Government that will soon be the only recognized Government of the Republic, should carry the weight that always attaches to the utterances of a whole nation.

"The contracts that the Government of Dr. Manuel Antonio Sanclemente may make, without being legally authorized, therefore, neither are nor will be recognized by the revolutionary government.

"The President of the Republic, Doctor Sanclemente, is not empowered to make contracts involving national interests without the assent of the legislative body appointed by the people. Whatever is done without that assent is therefore void.

"We make these statements merely to prevent all negotiations relating to an extension of time in the contract now in force with the Panama Canal Company. We concur in and sanction the statements that on the same subject has made an authorized representative of the revolution, Dr. Alirio Diaz Guerra, and those that will be made by Dr. Antonio Jose Restrepo, an agent especially appointed to act for the Provisional Government in this and other important matters.

"The relations between the company and the Republic of Colombia are of a purely civil nature and fall, of course, under the jurisdiction and laws of this country. The present Government is not empowered or authorized by any law whatsoever arbitrarily to alter the terms of the contract now in force.

"The Liberal party of Colombia considers it an act of criminal resignation to allow the repudiated Government to endanger the future of the country by an imprudent negotiation, and one of the objects of the war in which that party is now engaged is to prevent, or at least oppose, the further sacrifice of the interests of the Republic.

"G. VARGAS SANTOS.

"FOCION SOTO."

Senator MORGAN. The date of this manifesto is April 20, 1900. Was that the date, or about the date, when this money was paid by the Panama Canal Company for the concession from 1904 to 1910?

Senator KITTREDGE. I object to that question and to the witness being required to answer it, for the reason that the matter to which it refers is not pertinent to the inquiry with which this committee is charged, and it is not within the terms of the Senate resolution under which this committee is investigating.

Senator MORGAN. The discussion of that objection, Mr. Chairman, of course will have to proceed in executive session. I do not propose to disclose to this witness all that I have in mind in asking that question.

The CHAIRMAN. Will you allow that to go over until to-morrow morning, Senator Morgan?

Senator MORGAN. Yes; I am perfectly willing that that should go over. I presume the committee will now adjourn. However, I will

ask Mr. Cromwell a few other questions. That objection is postponed, as I understand?

The CHAIRMAN. Yes. I wish you would go on, Senator, as much as you can to-day, so that we can get along with this examination.

Senator MORGAN. All right. I think I have not been delinquent in my efforts to advance this matter. I would not have had this witness here, and the chairman knows it. I did not have him subpoenaed. He has been thrown in here for a purpose that I do not yet understand, and I want to get to the bottom of it if I can do it.

The CHAIRMAN. Proceed, Senator Morgan.

Mr. CROMWELL. I am here on the invitation of the committee, Senator.

Senator MORGAN. Yes; I know you are.

The CHAIRMAN. I think you had better proceed, Senator Morgan. I would like, however, to call attention to one thing, Senator Morgan. I do not wish to be misunderstood in regard to this matter. I think you will recollect the fact that I went to you in the Senate two weeks ago or three weeks ago, perhaps—Mr. Cromwell's name had appeared in the record here day after day and had been mentioned—and I went to you and asked you if you wished him summoned. You said no, you did not wish a subpoena sent for him; but you said you wished I would write him to come.

Senator MORGAN. No; I said I was willing for you to invite him to come.

The CHAIRMAN. At that suggestion I wrote Mr. Cromwell that we would expect him to appear before this committee.

Senator MORGAN. Very good. I never said I wished it.

The CHAIRMAN. I may have misunderstood it, but I certainly did it at the suggestion that you made to me. I explained the matter to other Senators. None of them said they wanted him to come, expressly; but I did it after the understanding that I had with you. But you did not say that you wanted him subpoenaed. You certainly said you did not want him subpoenaed.

Senator MORGAN. And did not object to his coming before the committee.

The CHAIRMAN. No; and I understood you that this was your wish, and that is the reason Mr. Cromwell is here.

Senator MORGAN. At my wish?

The CHAIRMAN. I understood that it was your desire; you did not want him summoned, but I understood you that you wished him to appear.

Senator MORGAN. I was not averse to his appearing.

The CHAIRMAN. I wanted to make that statement to the members of the committee, so that there will be no misunderstanding.

Senator MORGAN. Well, I want that question understood. I did not object to you subpoenaing him, but I said I would not ask him to be subpoenaed.

The CHAIRMAN. You certainly said that; but I understood it the other way, and what I wanted to have understood is why Mr. Cromwell is here. None of the other members of the committee that I did speak to about it—

Senator MORGAN. I assumed, and I still assume, that enough has been stated here by the other witnesses in this case to make it abso-

lutely necessary that Mr. Cromwell should come here if he expects ever to have any credit in the country at all.

The CHAIRMAN. I thought it was fair to Mr. Cromwell that he should appear before the committee.

Senator MORGAN. And therefore you summoned him?

The CHAIRMAN. I thought so myself; and I am merely making this explanation in order that it will be understood.

Senator MORGAN. Yes. Now, I want to give him a full opportunity to make explanation.

The CHAIRMAN. Now, we will proceed, Senator Morgan.

(At this point Senator Taliaferro requested Mr. Cromwell, as a director and as attorney for the Panama Railroad Company, to have the officers of that company produce a minute book of the board of directors running from the time of the transfer, on May 4, and to have said book brought to Washington by the young man who has been referred to as having taken down the minutes of November 8, in order that he may appear before the committee.

Mr. Cromwell replied that he would make every effort in his power to have this done.)

Senator MORGAN. There has been read to you your letter of December 5, 1898, addressed to Mr. Hay, and I have been endeavoring to get some explanations of it. I will read you another letter:

"NEW YORK, *December 21, 1898.*

"MY DEAR SIR: Further to my letter of December 5, 1898, receipt of which was acknowledged by your favor of the 8th instant, I beg leave to say that we are advised by our counsel at Bogota that the official minutes of the session of the House of Representatives declares that the bill concerning the extension of the New Panama Canal Company has not been acted upon for lack of time. We, however, yesterday received further cable advising us that the Government had granted the extension, subject to the approval of the next Congress, and I note from this morning's Herald that similar advices have been received by the press.

"It is the opinion of the Government executives and of ourselves that power to give such extension is already located in the Government by the terms of the original concession, but the formality of ratification will be requested in due course, and of its being granted we have not the remotest apprehension.

"You will thus see that my confidence in the attitude of Colombia, as indicated in my last note, has been fully and quickly confirmed.

"Faithfully, yours,

"WM. NELSON CROMWELL,

"*General Counsel New Panama Canal Company.*"

Who was that officer that you describe as "our counsel at Bogota?"

Senator KITTREDGE. I make the same objection to that question as to a former question.

Senator MORGAN. As irrelevant?

Senator KITTREDGE. I make the same objection.

Senator MORGAN. Please state it.

(The stenographer, by request, read as follows:)

"Senator KITTREDGE. I object to that question and to the witness being required to answer it, for the reason that the matter to which it

refers is not pertinent to the inquiry with which this committee is charged, and it is not within the terms of the Senate resolution under which this committee is investigating."

Senator MORGAN. So the Senator objects to his stating who the counsel was in Bogota?

Senator KITTREDGE. My objection shows.

Senator MORGAN. To what is it that you refer when you say: "It is the opinion of the Government executives and of ourselves that power to give such extension is already located in the Government by the terms of the original concession; but the formality of ratification will be requested in due course, and of its being granted we have not the remotest apprehension?"

Senator KITTREDGE. I make the same objection to that question.

Senator TALIAFERRO. Mr. Chairman, I move that the committee take a recess until 2 o'clock.

The CHAIRMAN. Can we not get along a little further, Senator Taliaferro, this morning?

Senator TALIAFERRO. There are objections right along, you see.

Senator MORGAN. I can not go against the witness and the objections both.

The CHAIRMAN. Perhaps the Senator will ask something to which there will be no objection.

Senator MORGAN. I will read you another paper here before we take a recess, Mr. Cromwell. [Reading:]

"NEW YORK, December 21, 1898.

"SIR: In addition to the certified copy of the official report of the International Technical Commission, which I had the honor of delivering to you on the 2d instant as a part of the communication of the company addressed to the President, under date of November 18, 1898, I now have the honor of handing you a copy of an additional report made November 19, 1898, by Messrs. Zurcher and Bertrand, eminent engineers of France, upon the cut of the Culebra and the Emperador mountains.

"The report of the International Technical Commission, as well as the inclosure, being part of our official communication to the President, are for your official files and use. I merely mention this that you may not courteously consider them confidential.

"I have the honor, etc.,

"M. HUTIN,

"Director-General of the New Panama Canal Company."

Did you know anything about that paper that you spoke of—"The report of the International Technical Commission, as well as the inclosure, being part of our official communication to the President, are for your official files and use. I merely mention this that you may not courteously consider them confidential?"

Mr. CROMWELL. I know of the communication, Senator, as there set forth, and which is on the files of the State Department.

Senator MORGAN. Yes; you wanted those papers, then, made public?

Mr. CROMWELL. They were official communications, sir.

Senator MORGAN. At that time Colombia was locked up in civil war, was she not?

Mr. CROMWELL. The phrase "locked up," Senator, I would hardly agree with.

Senator MORGAN. What phrase would you use to convey that idea?

Mr. CROMWELL. I would rather have you define what you mean by "locked up," sir.

Senator MORGAN. I mean that she was environed with civil war.

Mr. CROMWELL. You mean, sir, perhaps, that she was involved in civil war?

Senator MORGAN. Yes; and environed, locked up, and under a state of siege?

Mr. CROMWELL. I would not so describe it, sir. She had communication with all the world. I would not so describe it.

Senator MORGAN. She had communication with all the world?

Mr. CROMWELL. Yes, sir.

Senator MORGAN. Did she have mail communication with the United States?

Mr. CROMWELL. I do not know, personally.

Senator MORGAN. You do not know personally?

Mr. CROMWELL. No, sir.

Senator MORGAN. Did she have telegraphic or cable communication with the United States?

Mr. CROMWELL. Yes, sir.

Senator MORGAN. You know that personally?

Mr. CROMWELL. With one or two slight interruptions, that was quite continuous.

Senator MORGAN. You used that cable?

Mr. CROMWELL. I know as a fact that it was so.

Senator MORGAN. Did you use it?

Mr. CROMWELL. Oh, yes; I have used the cable; certainly.

Senator MORGAN. When—during that period of time?

Mr. CROMWELL. Oh, I do not know that I did during that period of time, sir.

Senator MORGAN. Or at the time mentioned here?

Mr. CROMWELL. No; I have no recollection of that, Senator, one way or another.

Senator MORGAN. During the war in Colombia did you use it?

Mr. CROMWELL. By "the war," sir, do you mean—

Senator MORGAN. I mean the fight that commenced at the time Sanclemente declared this Republic in a state of siege—the several Departments of it—and that continued on until we closed it by sending ships down here to Panama and taking the victory out of the hands of the liberals and established Marroquin in power—the whole period.

Mr. CROMWELL. I have no recollection, indeed, Senator, of any communications to Bogota during that period.

Senator MORGAN. You never had?

Mr. CROMWELL. No, sir.

Senator MORGAN. How do you know the cable was in communication, then?

Mr. CROMWELL. As a matter of public knowledge.

Senator MORGAN. Oh, I am not asking you for public knowledge.

Mr. CROMWELL. Oh!

Senator MORGAN. I am asking you for your personal knowledge. Do you know that that cable communication existed between Colombia and the United States?

Mr. CROMWELL. I do not know, sir, of my own knowledge whether it existed at that period. I do not know of my own knowledge whether it existed at that period.

Senator MORGAN. At the period during the war?

Mr. CROMWELL. Yes, sir; during the war.

Senator MORGAN. Do you know whether it existed before, of your own knowledge?

Mr. CROMWELL. Oh, I know there was cablegraphic communication with Bogota; certainly.

Senator MORGAN. Of your own knowledge?

Mr. CROMWELL. Well, substantially; yes.

Senator MORGAN. How did you know it? You could not have known it otherwise than by communicating with somebody in Bogota.

Mr. CROMWELL. Yes, sir; I could.

Senator MORGAN. How?

Mr. CROMWELL. My general knowledge of the isthmian affairs in connection with the Panama Railroad Company kept me advised of the general status of the situation.

Senator MORGAN. You have just sworn that you knew it yourself; that you had knowledge of it personally.

Mr. CROMWELL. In effect—there is a regular cable line between the United States and Bogota.

Senator MORGAN. No; that is not the way you stated it. You said you had personal knowledge of it, and that you knew it yourself. Is that true?

Mr. CROMWELL. During this particular period, Senator, do you mean?

Senator MORGAN. I am talking about before the time that the war commenced.

Mr. CROMWELL. Yes, sir; before the war commenced, I know, because I have myself had communications with Bogota by cable.

Senator MORGAN. With what person in Bogota?

Mr. CROMWELL. Well, that is confidential sir.

Senator MORGAN. That is confidential? It was on the business of the Panama Canal, then, was it?

Mr. CROMWELL. Certainly.

Senator MORGAN. Yes; so you had business at Bogota before that war commenced that you can not speak of because it was confidential and involves your confidences with your client, the Panama Canal Company?

Mr. CROMWELL. Yes, sir.

Senator MORGAN. Can you name the individual with whom you had those conferences? I want to get him and see if he agrees with you.

Mr. CROMWELL. For the same reasons, Senator, I can not.

Senator MORGAN. You can not name the individual. You decline, then, to state the name of the man that you had conferences with, so that the committee can get him and question him as to the truth of your statement?

Mr. CROMWELL. Senator, the form of your question is not correct. The form of your question, I think, is hardly courteous.

(At the request of Senator Morgan, the stenographer read aloud the pending question.)

Senator MORGAN. I will let it stand just that way. I will take it, form and all.

Mr. CROMWELL. I respectfully adhere to the statement that I can not disclose communications made with any persons within the scope of my professional engagement.

Senator MORGAN. Mr. Chairman, as far as I am concerned, I am ready for the adjournment.

Senator KITTREDGE. I think we should continue until about 1 o'clock, so as to get on as far as we can with this hearing.

The CHAIRMAN. Did you want to proceed with your examination now, Senator Morgan? Do you wish to proceed further at the present time?

Senator MORGAN. At any time; yes.

The CHAIRMAN. At the present time?

Senator MORGAN. I would prefer not to. I do not make any personal objection to it, though.

The CHAIRMAN. If we could go along half an hour more—it is 12 o'clock now—it would expedite matters a good deal.

Senator MORGAN. Well, I am due in the Senate, and I will claim my privilege.

Senator TALIAFERRO. I move that the committee take a recess until 2 o'clock.

(The committee thereupon took a recess until 2 o'clock p. m.)

(NOTE.—At the afternoon session Mr. J. E. Markel testified before the committee. His testimony will be printed after the completion of Mr. Cromwell's testimony.)

ISTHMIAN CANAL.

COMMITTEE ON INTEROCEANIC CANALS,
UNITED STATES SENATE,
Washington, D. C., Friday, March 2, 1906.

AFTER RECESS.

(The following are the proceedings after recess on March 2, which the committee subsequently directed to be printed in their regular order, instead of being withheld until the completion of Mr. Cromwell's testimony:)

At the expiration of the recess the committee resumed its session, Hon. J. H. Millard in the chair.

TESTIMONY OF JACOB E. MARKEL, ESQ.

Mr. MARKEL was duly sworn, and testified as follows:

The CHAIRMAN. Mr. Markel, as you all know, has had some considerable notoriety in a public way for some months in regard to a contract he entered into at Panama, and I felt it was due to him that he should come before the committee, and that it was due the committee that it should have him come. He is here now, and I propose first to ask him some questions myself. Afterwards any members of the committee may ask him such questions as they desire, and he probably wishes to make a statement to the committee himself.

Mr. Markel, will you state your name?

Mr. MARKEL. Jacob E. Markel.

The CHAIRMAN. And your present residence?

Mr. MARKEL. My temporary residence is in Chicago. My permanent residence and home is in Nebraska.

The CHAIRMAN. You are residing temporarily in Chicago now?

Mr. MARKEL. Yes, sir; temporarily.

The CHAIRMAN. You have lived at Omaha for the last thirty years, have you not?

Mr. MARKEL. Yes, sir; I have lived there forty years this coming July.

The CHAIRMAN. What has been your business during the time named, say the last thirty years, and where have you been carrying on such business?

Mr. MARKEL. My business practically for the last thirty years or more has been the construction, furnishing, and operation of hotels

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Mr. MARKEL. I had never met Mr. Shonts. I had met, in a casual way, Mr. Stevens, as I operated a large camp for the Rock Island road at Moline while he was second vice-president.

The CHAIRMAN. After leaving the Isthmus and returning to New York did you and others bid for the feeding of the employees of the railway company?

Mr. MARKEL. After returning from the Isthmus, or, in fact, while I was on the Isthmus, when I met the gentlemen in Colon on the 26th of July, the feeding proposition seemed to be the first one that claimed their attention. We talked the matter over quite a good deal on the way to Panama. That night at the governor's house the governor turned over to Mr. Shonts my letter of July 20, and after discussing the matter a while they decided to make a trip over the road the next day, and invited me to accompany them, which I did. The next day it was decided that something must be done, and that at once, to care for the silver-roll employees. I had suggested that they extend the commissary, then operated by the railroad company at Colon, by inaugurating a number of branch commissaries, and they requested me to do that, which I did, July 28, taking a special engine, which Mr. Stevens furnished me, and the chief architect, the superintendent of construction of buildings, a clerk from Governor Magoon's office, who was familiar with the buildings that had been left there by the French people. And we that day selected a number of buildings, the architect making plans and specifications and ordering the material, locating the subcommissaries or branch commissaries, which had no connection with the boarding houses or the hotel. It was simply a temporary arrangement to take care of the silver-roll people.

The CHAIRMAN. That was before there was any contract?

Mr. MARKEL. Yes; that was before I left the Isthmus. It was the 28th day of July.

The next day I made a written report to Chief Engineer Stevens, which I have a copy of here. After a discussion of the matter, the next day it was decided that I would return to the States, and that they would let me know what they could or what they would do. I left the Isthmus on the 1st and arrived in New York on the 8th, where I was met with a cablegram from Mr. Shonts advising that he would be in New York on the 14th and would discuss the feeding proposition with me. I waited in New York until he arrived, made an appointment with him, and met him here in Washington a week or ten days afterwards. I brought with me to Washington Mr. J. E. Smith, chief engineer of the Armour Company and refrigerator expert, and Mr. Gardner, chief engineer and refrigerator expert of the Swift people, and aided them in getting up the plans and the specifications for the refrigerator plant. They utilized certain blueprints for the refrigerator and the laundry and the bakery that I had gotten together before I went to the Isthmus. Before going there I devoted almost six weeks to getting together information that I thought it would be necessary for me to have.

The CHAIRMAN. That was before you went to the Isthmus?

Mr. MARKEL. Before I went to the Isthmus at all. That was between the time I met Mr. Wallace, the latter part of April, and my sailing, the 26th of June.

The CHAIRMAN. On your return from the Isthmus at that time

there was a letting of contracts, and, as I understand it, you were the successful bidder. Is that right?

Mr. MARKEL. Yes, sir.

The CHAIRMAN. That was for the gold men and the silver men both?

Mr. MARKEL. Yes, sir.

Senator TALIAFERRO. Do you mean that you were the successful bidder or the lowest bidder?

Mr. MARKEL. I was the successful bidder. As to whether I was the lowest, I do not know. I did not see the other bids.

Senator TALIAFERRO. Were you not sitting at a desk in the office of the Commission when the bids were opened?

Mr. MARKEL. No, sir.

Senator TALIAFERRO. You were not present there at all?

Mr. MARKEL. No, sir.

Senator TALIAFERRO. And you did not know at all, prior to the letting of this contract, what the bids of your competitors were?

Mr. MARKEL. I did not.

Senator TALIAFERRO. You knew nothing about it?

Mr. MARKEL. No, sir.

The CHAIRMAN. Mr. Markel, I want to ask you a question now in which I have a little interest, and I want you to give it a little consideration, in reference to this: Were there any influences, political, personal, or otherwise, that assisted you in any way, directly or indirectly, in obtaining that contract from the Panama Railway Company?

Mr. MARKEL. Absolutely none.

Senator TALIAFERRO. That is, you mean none that you know of?

Mr. MARKEL. Absolutely none. I mean just what I say, because when I was getting this information to go to the Isthmus it was not, as far as I know, a public matter. I did not consult with anyone but Mr. Wallace, Governor Magoon, and my own family, and the different firms from whom I was seeking information.

Senator TALIAFERRO. Did you conduct a hotel in Omaha, Nebr.?

Mr. MARKEL. Yes, sir; for a great many years.

Senator TALIAFERRO. Who owned that property?

Mr. MARKEL. At one time P. J. Sorge. I owned it for a great many years.

Senator TALIAFERRO. Who owns it now?

Mr. MARKEL. I think a man by the name of Rome Miller.

Senator DRYDEN. You have stated that when the bids were opened you did not know whether your bid was the lowest. Do you now know whether your bid was the lowest?

Mr. MARKEL. Why, no; not of my own knowledge. I never compared them, sir.

Senator DRYDEN. You have no knowledge upon that point?

Mr. MARKEL. No, sir.

Senator TALIAFERRO. Since you took charge of this hotel in Omaha will you state to the committee who have been the successive owners of the property?

Mr. MARKEL. The Millard Hotel?

Senator TALIAFERRO. Yes.

Mr. MARKEL. Shall I give all the history of it?

Senator TALIAFERRO. If you please. Just answer the question in your own way.

Mr. MARKEL. In 1881 Mr. Samuel Shears, Thomas Swobe, and myself, with Mr. Ezra Millard, J. H. Millard, J. D. Brown, and a man by the name of Gicominie organized a hotel company in Omaha called the Hotel Association of Omaha. That company bought the ground and constructed and built the hotel that is now known as the Millard Hotel, as it was then. Mr. Shears, Mr. Swobe, and Mr. Markel were the lessees of that hotel. We furnished it and operated it from 1882 to 1886, when Mr. Swobe and myself purchased the interest of Mr. Samuel Shears in the furniture and whatever stock he had in the company. Afterwards Mr. Swobe and I acquired all of the stock in the company.

Senator TALIAFERRO. At what time was that?

Mr. MARKEL. That was in the summer or fall of 1886. In the spring of 1891 the Hotel Association of Omaha sold the ground upon which the hotel stood to P. J. Sorge, of Middletown, Ohio, and took back what was then a very fashionable paper, a hundred-year lease, at 6 per cent interest net on the value of the ground as paid us by Sorge.

Senator TALIAFERRO. The leaseholders were whom, then?

Mr. MARKEL. The leaseholders were Markel and Swobe; the owners of the building and of the furniture and of the operation of the same were Markel and Swobe.

Senator TALIAFERRO. Have the Millards any interest in the property now?

Mr. MARKEL. None.

Senator TALIAFERRO. Since when did they part with their interest in the property?

Mr. MARKEL. I think it was in the fall of 1886 that I purchased Mr. J. H. Millard's stock, whatever it was, in the association.

Senator TALIAFERRO. I notice, Mr. Markel, in your list of expenses, which was made the basis of your settlement with the Government, the first item reads: "Cash expended by J. E. Markel, P. L. Markel, and secretary, traveling expenses, etc., up to September 19, 1905." You do not name your secretary there. Who was your secretary?

Mr. MARKEL. Did I not say "My secretary, Mr. McLaughlin?"

Senator TALIAFERRO. No; you did not mention him by name.

Mr. MARKEL. I thought I did. Were you reading from the original bill?

Senator TALIAFERRO. From the bill you rendered the Government. You say, "Expended by J. E. Markel, P. L. Markel, and secretary."

Mr. MARKEL. Do you want the name of the secretary?

Senator TALIAFERRO. Yes.

Mr. MARKEL. J. M. McLaughlin.

The CHAIRMAN. Would you object to me finishing my questions first?

Senator TALIAFERRO. Not at all. I beg pardon. I thought you had finished.

The CHAIRMAN. Did you wish to finish some point right there?

Senator TALIAFERRO. No; it is all right.

The CHAIRMAN. Mr. Markel, who were your partners, if any, in that business at the Isthmus, and how much money or credit did you

anticipate it would require to carry that business on to the satisfaction of all concerned in it?

Mr. MARKEL. My partner was my father-in-law, Mr. Leroy B. Wadleigh, now a resident of Pierre, S. Dak., for many years a lumber merchant and banker of Clinton, Iowa. Mr. Wadleigh and myself had arranged to put into the enterprise \$100,000 in cash, and in addition to that I had arranged with different firms, with whom I had contracts, for a credit of from \$60,000 to \$100,000, as we had decided it would take from \$150,000 to \$200,000 of cash and credit to properly operate the business.

The CHAIRMAN. On what date did you make this contract that you speak of and on what date was it canceled?

Mr. MARKEL. The contract was made September 7, as I remember it. I think I have the dates here. It was made September 7 in the office of the Panama Railroad, 24 State street, New York. It was canceled both verbally and in writing on the Isthmus, at Panama, October 9.

Senator MORGAN. Let me make an inquiry right there. Was it canceled because it was found to be defective, or just as a matter of favor to the parties?

Mr. MARKEL. Well, Senator, I was not present when it was canceled.

Senator MORGAN. Then you do not know? You had to agree to the cancellation?

Mr. MARKEL. I will tell you what I was told.

Senator MORGAN. You had to agree to the cancellation?

Mr. MARKEL. Originally, or at the beginning, the contract had a thirty-day cancellation clause in it.

Senator MORGAN. The original?

Mr. MARKEL. The contract.

Senator MORGAN. As you signed it?

Mr. MARKEL. Yes, sir; and as it is now.

The CHAIRMAN. I think the questions that I want to ask him will explain that, Senator.

Senator MORGAN. Very good.

The CHAIRMAN. I was going to ask you right there, Mr. Markel, if you know why the contract was canceled?

Mr. MARKEL. I was not present at the meeting of Mr. Shonts, Mr. Stevens, Governor Magoon, and Jackson Smith. I had had on my second visit to the Isthmus a good many talks with these officials because of some disquieting telegrams that were received in New York before I went to the Isthmus, but at this meeting on October 9 I was told by Governor Magoon that the contract had been canceled.

The CHAIRMAN. That was at Panama?

Mr. MARKEL. That was at Panama. I was told that Mr. Stevens still was of the opinion that they were feeding the people for less money than my contract called for, but my opinion was that it was canceled because of Mr. Stevens's opposition, based upon misrepresentations made to him by Jackson Smith as to the cost of the keep of the men.

Senator MORGAN. Who is Jackson Smith?

Mr. MARKEL. One of Mr. Stevens's assistants down there.

Senator MORGAN. Is he an engineer?

Mr. MARKEL. I think not.

Senator MORGAN. He is a clerk, is he?

Mr. MARKEL. I think he has charge of the quarters there.

Senator MORGAN. Oh, yes.

The CHAIRMAN. Under that contract the Government had the right at any time to cancel it on thirty days' notice, did they not?

Mr. MARKEL. That was under the agreement we made in New York, Senator. On my arrival in New York on September 22 with my employees, ready to go to the Isthmus to take charge of the two hotels that were then constructed, on going to Mr. Shonts's office I was advised by him of some disquieting telegrams that had come from the Isthmus, and he thought it best that the matter be held in abeyance until that could be investigated.

Senator MORGAN. Let me see if I understand you, because I am somewhat confused about the situation. The original contract, as signed, contained a power of cancellation by either party with thirty days' notice?

Mr. MARKEL. No, sir; by the railroad company solely.

Senator MORGAN. Was the original contract with the railroad company?

Mr. MARKEL. Yes, sir.

Senator MORGAN. And it contained that provision, that on thirty days' notice it could be canceled?

Mr. MARKEL. Yes, sir.

Senator MORGAN. Had you received the thirty days' notice when you met Mr. Shonts in New York?

Mr. MARKEL. No, sir; no, sir.

Senator MORGAN. Then, I suppose, he did not notify you that the contract had been canceled, but that he would cancel it on the expiration of thirty days' notice?

Mr. MARKEL. No; he did not, Senator. Shall I explain just what happened?

Senator MORGAN. If you please. I want to get at the situation.

Mr. MARKEL. I arrived in New York September 22 with my crew of people to take charge of the two hotels.

Senator MORGAN. How many people?

Mr. MARKEL. I had twelve of the leaders.

Senator MORGAN. You were going to take them to the Isthmus with you?

Mr. MARKEL. I was going to take them to the Isthmus with me; yes, sir. They were simply the head waiter, head cook, and manager. The scullions, dishwashers, pantry boys, and such things as that I expected to get there on the Isthmus.

Senator MORGAN. You had gone that far in the execution of your contract with the railroad company?

Mr. MARKEL. Yes; I had gone further than that, and made contracts for meats, both fresh and salt, for a year; and I had made contracts for butter. I had made contracts for a number of articles, and I had sent my purchasing agent to the Isthmus to familiarize himself with conditions in the Tropics, and to go over there to Jamaica and Martinique and the other islands and familiarize himself with the foods that the Jamaica negroes and other islanders down there used, so as to get at the bottom figures, to enable us to buy our stuff right.

Senator MORGAN. Right there I wish to inquire whether your original contract was based upon a menu that was agreed upon?

Mr. MARKEL. Yes, sir.

Senator MORGAN. And that is printed here in these papers?

Mr. MARKEL. Yes, sir.

Senator TALIAFERRO. Where did you get that menu?

Mr. MARKEL. It was in the original contract; in the advertisement that was sent out asking for bids.

Senator TALIAFERRO. Have you that advertisement, or a copy of it?

Mr. MARKEL. I have not. I have the contract here. That is all I have.

Senator TALIAFERRO. The contract that was let to you?

Mr. MARKEL. Yes, sir.

Senator MORGAN. That is the same contract published in Senate Document No. 127, is it not?

Mr. MARKEL. Yes, sir.

Senator TALIAFERRO. It has been stated and sworn to, Mr. Markel, that your bid was accompanied by a menu prepared by your competitors. Is that true?

Mr. MARKEL. No, sir; it is not—that is, as far as I know. Have you a copy of the contract there?

Senator TALIAFERRO. I think not.

Mr. MARKEL. There is the original contract, Senator, and that is the original advertisement asking for bids. That was the kind of paper that was bid on. There is the bill of fare [exhibiting papers].

Senator MORGAN. And that was a part of the contract?

Mr. MARKEL. Yes, sir.

Senator MORGAN. Or rather it is an appendix to it to illustrate it?

Mr. MARKEL. Yes, sir; and in addition to that there was submitted a bill of fare that proposed to give the meals for each day, beginning at Sunday breakfast and ending with Saturday night supper.

Senator MORGAN. Was that put in there? Is that in there?

Mr. MARKEL. I think that was attached to the original papers if it is not attached to that.

Senator MORGAN. I remember to have seen it, and it made my mouth water. I thought that it was a very nice bill of fare that you were fixing up for them. [Laughter.]

Mr. MARKEL. That, Senator, was no different from what is in there, only it said Sunday, Monday, Tuesday, Wednesday, etc.

The CHAIRMAN. Mr. Markel, in a contract of that kind, had you entered into the business regularly, which they could terminate at thirty days' notice, have you ever considered how it would have affected you in your matters? Have you ever thought of that?

Mr. MARKEL. There is an old saying, "A fool for luck;" but I, Senator Millard, have to take a business man's chance. In the contract there was an agreement that if the contract was canceled by the railroad company they would purchase whatever supplies I might have on hand at the hotel and camps and in the storeroom at Colon or in transit, and that they would assume any food contracts that we had.

Senator MORGAN. I want to ask you whether any provision was made for canceling your several contracts for different supplies that you mentioned a while ago? You made contracts with different people in anticipation of going there to take charge of that hotel business?

Mr. MARKEL. Yes, sir; but I had a string to them, Senator.

Senator MORGAN. And you pulled it?

Mr. MARKEL. Yes, sir.

Senator MORGAN. And that let you out without damage?

Mr. MARKEL. Oh, yes, sir. I paid no damages there. On the other hand, there was one young man whom I had employed as purchasing agent to handle my meats and butter, etc. I had made a contract with him.

Senator TALIAFERRO. Who was that?

Mr. MARKEL. Mr. John D. Howe.

The CHAIRMAN. Who was he working for before he went with you?

Mr. MARKEL. He was working with the Armour Packing Company for fifteen years or more.

The CHAIRMAN. Did he go back to them?

Mr. MARKEL. Yes, sir.

The CHAIRMAN. Do you recollect, without referring to the papers, what was the price that you had in your contract with the Panama Railroad Company for the gold men and also for the silver men?

Mr. MARKEL. Yes, sir. I agreed to care for the gold-roll people at \$36 a month. That was divided in this way: Thirty dollars for meals and \$6 for the care of the rooms. I had agreed to furnish the bill of fare as we bid upon it, and to furnish each guest a complete change of bed linen every day, two hand towels, and two face towels. That included care of the rooms, furnishing of the soap, and everything of that kind, as is usually done in an ordinary \$2 a day or country town hotel.

The CHAIRMAN. They have not always done that in the country hotels that I have visited. [Laughter.]

Mr. MARKEL. Well, sometimes. [Laughter.]

For the silver roll, my contract was 40 cents a day. That contemplated tables and seats, thorough sanitation of the cooking apparatus and the dishes, and a decent way of feeding the people. That is the menu that you will find in the contract there.

The CHAIRMAN. That is for the silver men?

Mr. MARKEL. Yes, sir.

Senator ANKENY. Are those prices made upon a silver basis?

Mr. MARKEL. No, sir; the price was based upon gold.

Senator ANKENY. Both prices?

Mr. MARKEL. Yes, sir.

The CHAIRMAN. That was 40 cents a day?

Mr. MARKEL. Yes, sir; in gold.

The CHAIRMAN. That was for feeding them?

Mr. MARKEL. Yes, sir.

The CHAIRMAN. They lodged—

Mr. MARKEL. The contractor had nothing to do with their lodgings. They lodged in the different houses that were left there by the French people.

Senator TALIAFERRO. Was the contractor to furnish rooms?

Mr. MARKEL. Not for the silver roll.

Senator TALIAFERRO. For the gold roll it was?

Mr. MARKEL. Yes; for the gold roll. It was understood, while it was not set out in the contract, that the gold-roll people that lived and roomed in the cottages in and about the hotel should have the

hotel privilege if they wanted it at \$30 per month—that is, for meals.

The CHAIRMAN. You may make any other statement that you wish to make in a general way, Mr. Markel, in regard to matters there, and then the gentlemen of the committee will ask you questions, no doubt.

Mr. MARKEL. Did I answer your question there about how I was going to get even, if they did cancel the contract?

The CHAIRMAN. That is a mere matter of judgment. I was going to ask you how you were going to come out. I do not know whether it is a proper question or not, but I would like to know whether you have really considered the matter as to whether you would care to enter into a contract of that kind on the same terms at the present time, knowing what you do about the situation?

Mr. MARKEL. Well, I think I had a profitable contract. I had gone over the ground thoroughly. I have been nearly fifty years now in this business. I was very careful in making up my figures. It takes so much meat and so much bread and so much help to feed a man a day. I knew what it cost in the United States, and I knew what it cost when I got it on the Isthmus; and I know my figures were right. I have got a statement here which I will read before I get through.

The CHAIRMAN. The only objection that I see to your last statement is as to your age. You are getting yourself pretty well along, are you not? You say you have been in the business for fifty years?

Mr. MARKEL. I have. I started at 8 years of age to work at my trade. I am a baker and confectioner by trade. I began early, so as to get a front seat.

The CHAIRMAN. We have some figures here from the Commission in regard to the feeding, but I think we will consider them when we have an executive session.

Senator ANKENY. I see, or I think I see, that you are pretty careful in regard to those matters that you have been speaking about, and I want to ask you one or two questions that have no bearing upon this examination particularly. What did you find upon the Isthmus of Panama that you could buy there to advantage? Did you find potatoes, for instance, or did you find any vegetables?

Mr. MARKEL. There was not a thing, Senator.

Senator ANKENY. The point is, what could you find that it was profitable for you to buy there, rather than here? Or did you have to ship everything?

Mr. MARKEL. I am glad you asked me that question. That was the first thing that I took up when I went to the Isthmus, that I might be informed, so that if the Commission decided to do the work themselves I could turn that information over to them. The first thing I tried to buy was cattle. I found that there was one party there who owned all the cattle, and after some negotiations I was told that I could buy the cattle at \$55 a head.

Senator ANKENY. What did they weigh?

Mr. MARKEL. They would dress from 275 to 300 pounds. That would be from 500 to 550 pounds on foot. At \$55 per head (that would be \$27.50 in gold) dressed, that meat would cost 10 cents a pound.

Senator ANKENY. I understand.

Senator TALIAFERRO. Oh, no; not at \$55 a head.

Mr. MARKEL. That \$55 was silver; \$27.50 in gold.

Senator TALIAFERRO. You say you gave \$50 a head?

Mr. MARKEL. No, sir; I said the price was \$55 a head. That meant silver, Panaman currency, or the equivalent of \$27.50 in gold. If the cattle only dressed 275 pounds, that would be about 10 cents a pound for the meat, bones and all, and very poor meat at that.

Senator ANKENY. My intention in asking you these questions is to get at what they did produce there on the Isthmus that would go toward the support of people that we had there.

Mr. MARKEL. Yes, sir.

Senator ANKENY. It is not to find out whether you made or lost anything about it. This is for information, because I believe you know better than the others. I asked to get this information about what we can produce on the Isthmus. This is to be used in another place.

Mr. MARKEL. I spent a great deal of time just on that investigation.

Senator ANKENY. I saw that you knew by your evidence.

Mr. MARKEL. And in addition to that, I looked up the matter of whether I could get potatoes. They did not raise any potatoes.

Senator ANKENY. That happened to be the only article that I mentioned.

Senator MORGAN. You mean Irish potatoes. They raise sweet potatoes there, do they not?

Mr. MARKEL. Not a great many of them. Ninety-five per cent of all the yams and yuccas that are used on the Isthmus come from Jamaica. I had intended to inaugurate at each one of those hotels a garden to raise fresh vegetables.

Senator ANKENY. You knew by experiment that you could do that?

Mr. MARKEL. I knew that I could. There is no place on earth where they can raise as many and as nice vegetables as on the Isthmus. They do not do it. Then, another matter that I had up similarly was this: I was negotiating with a large firm at Gloucester, Mass., to send a fleet of fish boats down there. There is no place on earth where they have as many fish as at the Isthmus, both on the Atlantic and the Pacific sides.

Senator ANKENY. What fish do you remember that you could get in quantities there?

Mr. MARKEL. All kinds.

Senator ANKENY. Cod?

Mr. MARKEL. Sheepshead, Spanish mackerel, and all other fish—halibut; I do not know of any fish that you do not get there; and they are just as fine as they can be.

Senator ANKENY. That was the information that I wished to get.

Mr. MARKEL. I had it under negotiation, and if I had carried out this contract this firm would have sent a fleet of boats down there that would have insured me an ample supply of good fresh fish.

Senator ANKENY. Including halibut, sheepshead, and cod?

Mr. MARKEL. Everything. The surplus this firm intended to ship to the New York market, utilizing the refrigerators that the Government put on these steamers, that would go down full and return empty. It would have given the railroad company—that is, the steamship company—some good business with their refrigerators, which returned from the Isthmus empty.

Senator ANKENY. In your opinion, that is a very important industry down there?

Mr. MARKEL. I think it is a very important industry.

The CHAIRMAN. Gentlemen, I had some personal reasons for asking questions in regard to this matter, but I do not wish to detain the committee any more about it just now. If any other Senator wishes to ask further questions of Mr. Markel, I shall be glad to have him do so.

Senator TALIAFERRO. Mr. Markel, I have here what purports to be an affidavit in the form of a statement to the authorities here in Washington in connection with the letting of this contract to you.

Mr. MARKEL. Yes, sir.

Senator TALIAFERRO. That statement is signed by Houlder Hudgins and Charles J. Dumas. Do you know those gentlemen?

Mr. MARKEL. No, sir; only as I have, of course, seen the newspaper controversy last summer. I do not know them personally.

Senator TALIAFERRO. I am going to read you what they say.

Mr. MARKEL. Yes, sir.

Senator TALIAFERRO. I do not know that it is necessary to encumber our records with it. The committee can decide afterwards whether they desire it in the record. It is an affidavit filed in the Department here in the form of an explanation of the way this contract was let to Mr. Markel.

Senator KITTREDGE. I think it should go in the record.

The CHAIRMAN. Yes; why not?

Senator TALIAFERRO. I have no objection to its going in.

Senator KITTREDGE. I think it should go in.

The CHAIRMAN. Yes.

Senator TALIAFERRO. I propose to read this in full, because it has just come to the committee, and I have not had an opportunity of reading it through. [Reading:]

“In the matter of the award of the privilege of feeding and lodging employees on the Isthmus of Panama.

“STATE OF NEW YORK,

“*County of New York, ss:*

“We, Houlder Hudgins and Charles J. Dumas, being duly sworn, depose and say:

“We are engaged in business in the city of New York as commissary contractors, and have been for the three years immediately prior to the 1st day of July, 1905, the holders of the Government privilege of feeding immigrants at the Ellis Island immigrant station, New York.

“Believing that a privilege would at some time be granted to supply the employees at the Isthmus of Panama with food and lodging, we have entertained this subject for upward of a year last past. Since July 1, 1905, we have devoted practically our entire attention to this matter, and on August 4 sent to Chairman Theodore P. Shonts, of the Canal Commission, a telegram (Exhibit A) expressing our desire to bid for the privilege, which we understood was to be granted.

“Following our telegram we wrote Mr. Shonts, on August 23, 1905, a letter (Exhibit B) saying, ‘all we need is to know what the requirements are, and we assure you that we can be depended upon to meet

promptly and satisfactorily any reasonable commissary situation.' On August 30 we again wrote Mr. Shonts a letter (Exhibit C) volunteering information which we deemed of assistance to him in preparing specifications and offering to submit to him sample menus covering an entire week. To this last letter we received a reply from Mr. Shonts, dated September 1, 1905 (Exhibit D), setting forth in a general way the nature of the plant which the Commission intended to supply and a few comments as to what the final plans would contain. On Saturday, September 2, at about noon at the close of the week-end business day preceding a double holiday (Sunday and Labor Day), we received from Washington a letter from Mr. D. W. Ross, the general purchasing officer of the Commission, dated September 1, 1905 (Exhibit E), inclosing a draft of a contract for the work in question, and requesting from us a proposition on the terms outlined in the draft, to be delivered to Mr. Shonts at his office in New York City at 12 o'clock noon of the following Monday, September 4 (Labor Day).

"This draft of contract was the only paper ever submitted to us containing any specifications, and called for proposals to be submitted within two days, both of which were holidays. We hastily prepared our bid, however, and in order to expedite the matter incorporated in it the 'sample menus' as requested by Mr. Shonts, and were prepared to submit the same to him at the time called for, viz, at noon on Labor Day, September 4. Mr. Shonts, however, did not appear at his office until the following day, September 5, on which day at noon, the time which we were informed he would receive the bids, we submitted to him in person our proposal, to which were attached the original copies of the 'sample menus' above referred to (Exhibit F).

"In our bid as submitted we made the following offer:

"We have sought to present a schedule of prices which will yield a net return of 6 per cent, and we are willing to interpolate in the contract a stipulation limiting profits to this amount, binding ourselves to disburse at the end of each year for Christmas festivities, for the creation or assistance of an amusement fund, or for such other purposes as the Commission may determine, any surplus over a net return of said 6 per cent."

"Up to the time of the submission of our proposal these sample menus had not been seen by any person but ourselves and our stenographer. Mr. Shonts thereupon opened our bid and said he would give the matter proper consideration. Our bid proved to be the lowest one of three bids submitted. At about 3 p. m. of the following day, September 6, Mr. Shonts sent to our office, by his secretary, a letter, dated such day (Exhibit G), containing new conditions, to be binding on the bidder, not mentioned in the original specifications, such as requiring the bidder to erect electric-light plants, the number of which was not mentioned, and other requirements regarding the amount and character of linen and towels to be furnished, and concluding with the statement that the writer feared from the prices we had made that we had not considered all the items mentioned in his letter, in consequence of which our prices were lower than they otherwise would be, and offered us the privilege of 'revamping' our bid if we cared to do so. At about 3.15 we obtained possession of Mr. Shonts's letter, and while giving the matter due consideration received a hurried call from the secretary of Mr. Shonts, stating that the letter must have an answer by 4 o'clock of the same day.

"At 3.30, when we became entirely familiar with the purport of Mr. Shonts's further requirements, calling for the outlay of many thousands of dollars in addition to that called for in the original bid, we set to work, within the half hour given us, to modify our bid. Summoning a stenographer, we dictated a new proposal (Exhibit H) and repaired to Mr. Shonts's office at about 4 o'clock for the purpose of submitting the same. At about 4.30 we were received by Mr. Shonts and gave him our proposal, which he read and made no comment concerning it. We remained with Mr. Shonts until about 5 o'clock, at which time Mr. Ross, who was in the office all during the session, remarked that Mr. Jacob E. Markel, the other bidder, had not yet been heard from, although he had promised to submit his bid by 4 o'clock."

Is that part of the statement true?

Mr. MARKEL. Not that I know of.

Senator TALIAFERRO. You know when you submitted your bid, do you not?

Mr. MARKEL. Yes, sir.

Senator TALIAFERRO. When did you submit your bid?

Mr. MARKEL. Before that time.

Senator TALIAFERRO. What time is this?

Mr. MARKEL. September 6, was it not?

Senator TALIAFERRO. This was September 4.

Mr. MARKEL. Well, at the same time, at the Waldorf Hotel, I received a copy of the same letter that they speak of.

Senator MORGAN. Changing the contract and specifying additional work?

Mr. MARKEL. Yes, sir; and additional expense. And inasmuch as I had figured on that before, I answered the letter and said that I knew what the contract was, and that I did not wish to change my bid.

Senator TALIAFERRO. Have you among your papers a copy of your bid?

Mr. MARKEL. No, sir; the only copy there is is in this contract.

Senator TALIAFERRO. Have you among your papers anything that will refresh your memory as to the date and hour of the day that you submitted your bid?

Mr. MARKEL. Yes, sir.

Senator TALIAFERRO. Please produce it.

Mr. MARKEL. I have it here. There is my letter in reply to the letter that they speak of there [exhibiting letter to Senator Taliaferro].

Senator TALIAFERRO. Just read it.

Mr. MARKEL (reading):

"NEW YORK, September 6.

"THEODORE P. SHONTS,

"24 State Street, New York.

"DEAR SIR: Replying to your letter of even date, in reference to my understanding of the proposition looking toward the care and keeping of the employees of the Panama Railroad and Canal Commission, I beg to advise that all of the matters mentioned in your letter have been fully considered by me. In submitting my bid my understanding of that portion of your specifications referred to in

your letter of to-day was the same as yours, and I herewith assume all responsibility therein contained."

Senator TALIAFERRO. Did that letter from the chairman of the Commission to which the one you have just read is a reply set up the requirement referred to in this affidavit, that electric lights were to be supplied?

Mr. MARKEL. Yes, sir; there is a copy of the letter here, if you care to have it.

Senator TALIAFERRO. I would ask that that letter be put in the record. Read it, please. Just one moment, until I see how the letters correspond. Wait until I find the letter that is among the paper that I have here. Now go ahead.

Mr. MARKEL. With your permission, Senator, I want to say that I got a copy of the proposal on the same date that the gentleman mentioned. I went to the office at noon Monday, and I found that it was a holiday. I was advised by the clerk then in the office that Mr. Shonts had telephoned from his home that he had forgotten that it was a holiday, and to tell anyone who came there that he would be in the office the next day. This was about noon on Monday, September 4, Labor Day, and I went back to my hotel. I was there at noon, September 5, and put in my bid, or was prepared to put it in, when I was advised by Mr. Shonts that Mr. Balfe, one of the other bidders, had requested further time, and that he would postpone the letting. Our bids were in, but he said that he would hold off until the next day at noon, until Balfe & Co. could get in their bid, which was September 6.

Senator TALIAFERRO. And your bid went in on September 6?

Mr. MARKEL. On September 5, the same as Messrs. Hudgins & Dumas. Mr. Balfe's was not ready.

Senator TALIAFERRO. Did it go in on the 5th or on the 6th, Mr. Markel?

Mr. MARKEL. I presented it there. I do not know whether it went of record or not. We all put them in together. I did not know those gentlemen and I do not suppose they knew me. My bid was there; whether theirs was or not I do not know. This letter is dated "New York, September 6"—

Senator TALIAFERRO. Was not September 5 a legal holiday?

Mr. MARKEL. No, sir; September 4 was a legal holiday. Monday, September 4, was a legal holiday, and the next day, when we were ready to bid, at the request of Balfe & Co. the letting was put off one day.

Senator DRYDEN. Do you know whether any of the bids that went in on the 5th were opened?

Mr. MARKEL. I do not, sir.

Senator DRYDEN. So far as you know, all the bids were opened at one time, on the following day, and that was the 6th?

Mr. MARKEL. Yes, sir.

Senator DRYDEN. You assume that to be so?

Mr. MARKEL. Yes, sir: I assume that to be so. I do not know it, of course. I was not present, but I assume that that is the fact.

This is Mr. Shonts's letter to us, changing some of the specifications—

Senator TALIAFERRO. Who signs it? Does Mr. Shonts sign it or does Mr. Ross sign it?

Mr. MARKEL. Mr. Shonts.

Senator TALIAFERRO. This one that I have here is signed by Mr. Ross.

Mr. MARKEL. As he told me afterwards, and as I have seen in his testimony here, there was such a difference in the bids that he presumed that somebody was mistaken; that they did not understand what they were doing.

Senator TALIAFERRO. What was the difference in the bids?

Mr. MARKEL. Why, I do not know.

Senator TALIAFERRO. What did you infer?

Mr. MARKEL. I inferred that there must have been a large difference.

Senator TALIAFERRO. Do you mean a lower bid than yours?

Mr. MARKEL. A lower and a higher; and, as Mr. Shonts says in his testimony here, that is the fact.

Senator MORGAN. Lower in part and higher in part?

Mr. MARKEL. Yes, sir; and then higher altogether.

Senator MORGAN. Altogether?

Mr. MARKEL. And lower in part and higher in part.

Senator MORGAN. Yes; but yours was, taking the average through, the lowest bid?

Mr. MARKEL. Yes, sir; taking the average through. Mr. Shonts testified here that Hudgins & Dumas's first bid was very low. They afterwards changed it because of this letter. Shall I read the letter?

Senator TALIAFERRO. Yes.

Mr. MARKEL (reading):

"NEW YORK, September 6, 1905.

Mr. J. B. MARKEL, *Waldorf Hotel, New York.*

"DEAR SIR: Referring to your bid for feeding the employees of the Isthmian Canal Commission:

"In order to prevent any subsequent misunderstanding, beg leave to make certain points clearer than possibly our specifications made them.

"Where neither the railroad nor Commission own electric plants, as mentioned in our specifications, we would expect the contractor to put in small electric-light plants, such as are used in this country, as kerosene is too dangerous a commodity to have around our buildings."

Would you like me to explain those things?

Senator TALIAFERRO. No; the letter will explain itself.

Mr. MARKEL. They made a statement about the enormous amount of money that would have to be expended for electric lights.

Senator TALIAFERRO. No; that letter speaks for itself.

Mr. MARKEL. The fact is that the electric-light plants to run one of those hotels would cost \$425. [Continuing reading:]

"In regard to bed linen and towels, would say the Commission would expect the bed linen to be changed daily, and one bath towel and two hand towels be furnished for each person each day, besides a supply of roller towels in the public wash room. The bath towels should be at least 24 by 48 and the hand towels 17 by 34 inches in size.

"I also desire to call your attention to the large amount of veranda space surrounding the hotels. These verandas, as well as the walks and grounds around the hotels, must all be kept in a thoroughly clean

and sanitary condition. I inclose you a photograph of the Culebra Hotel in order that you may have an idea of the amount of veranda space to be kept in order. This, in addition to the interior of the hotel, must be taken into consideration in figuring on the maintenance and care of the rooms.

"In a general way our gold employees are men of education and refinement, who draw salaries of from \$125 to \$600 a month, and are used to not only comforts, but many of the luxuries of life. The service and meals we would expect furnished this class of employees must be of a high grade, both in quality of material cooked and in the manner of serving at the table, and should approximate the service of a \$2 hotel in the States. In view of the climatic conditions I desire also to call your attention to the fact that it will be necessary to ship only the best grade of export meats to the Isthmus.

"In regard to service for silver men, it is expected that the houses and surroundings in which silver men are fed shall also be kept in a neat, clean, and sanitary condition, and that the cooking utensils and tableware shall be kept clean and sanitary. In order to accomplish the latter it will be necessary to sterilize same after each meal. The tables will be covered by white oilcloth kept clean. Again, in order to prevent all misunderstanding, would say that the price of meals for silver men must include the care of the buildings, grounds, tables, cooking utensils, etc., as so far as they are concerned there is no care for rooms.

"In regard to the sale of uncooked food, the contract contemplates not only the sale of cooked and uncooked foods, but the other items mentioned. So far as tobacco and cigarettes are concerned, that is governed by concession sold by the Panaman Government each year, and the contractor would either have to pay him duty or buy from the concessionaire who controls that business on the Isthmus."

That means to pay Brandon Brothers, who had the contract, the duty or buy from the concessionaire.

Senator TALIAFERRO. Have you read that just as he wrote it? It is here "and the contractor will either have to pay duty"—that is, to the Government.

Mr. MARKEL. "To pay him duty."

Senator TALIAFERRO. There is no "him" here. It says: "The contractor would either have to pay duty or buy from the concessionaire who controls that business on the Isthmus." Certainly he would not have to pay duty to an individual.

Mr. MARKEL. He certainly would, if he had the contract. Brandon Brothers had the contract.

Senator MORGAN. They had what the Spanish and Latin nations call a monopoly of the tobacco trade?

Mr. MARKEL. Yes, sir.

Senator MORGAN. Nobody else was authorized to sell it?

Mr. MARKEL. No, sir. My understanding of it when I was on the Isthmus was that Brandon Brothers paid the Panaman Government \$30,000 a year.

Senator MORGAN. For that monopoly?

Mr. MARKEL. And that gave them a monopoly of the cigar, tobacco, and cigarette business on the Isthmus.

Senator MORGAN. And this proposition about buying tobacco and

cigars informs the hotel man that if he used tobacco and cigars he would have to pay that duty?

Mr. MARKEL. He would either buy from Brandon Brothers or, if he imported it himself, he would pay the duty to Brandon Brothers. That is what it meant.

Senator MORGAN. I have always thought they would smoke us out of there after a while. [Laughter.]

Mr. MARKEL. Shall I proceed with the reading of this letter?

Senator TALIAFERRO. Yes.

Mr. MARKEL (continuing reading):

"It is not intended that the contractor will sell general commissary goods outside of uncooked goods and the articles mentioned, for the reason that there is a treaty obligation between the United States Government and the Panaman Government, limiting the sale of commissaries to certain classes of employees, and it is the purpose of the Commission to limit the sale of food stuffs, etc., to the items mentioned in our specifications, so that our Government can keep the control of the commissaries in its own hands, so as to regulate it as occasion requires. We will expect the contractor to cooperate with the Commission in its efforts to avoid friction as between the two Governments.

"It is the intention of this agreement to limit the sale of these cooked and uncooked foods and other items mentioned to employees of the Commission and of the railroad company, and not to do a general merchandising business.

"It is also clearly understood that the prices shown in the specifications for freights on steamships and in cold storage is limited entirely to goods used in feeding the railroad company and Canal Commission employees, and not to outsiders."

Senator TALIAFERRO. Just one moment. Both these letters will go into the record?

Mr. MARKEL. Yes.

Senator TALIAFERRO. I want to call attention to the fact that up to and including the word "business," which you have read just before the last period, these letters correspond. In place of the paragraph that you have just read in your letter this letter states: "I mention this particularly fearing that this is not clearly understood by you, and that you did not consider this fully in making your prices for meals." That is what is in this letter. Now go ahead. I wanted to call attention to the difference.

Mr. MARKEL (continuing reading). "You also understand that the yams, yuccas, and dried fish required by the Jamaican laborers can not be secured any place except on their island. I presume you are familiar with the method required to produce these supplies and the cost of same, as they will be a very prominent item in the food required by this class of labor.

"I will be glad if you will please state that in submitting your bid your understanding of those portions of our specifications referred to by me is the same as stated by me in this communication."

(The complete affidavits of Messrs. Hudgins and Dunas, together with the exhibits appended thereto are printed at the end of to-day's proceedings.)

Senator MORGAN. Mr. Markel, I thought I heard you mention the word "treaty" in reading that letter from Mr. Shonts to you?

Mr. MARKEL. No, sir. Before that. I will look it over Senator.

Senator MORGAN. You said something was in consequence of a treaty with Panama.

Mr. MARKEL. In regard to the cigarettes?

Senator MORGAN. Yes; all that.

Mr. MARKEL. Yes, sir. Shall I read that?

Senator MORGAN. Yes, sir; repeat that.

Mr. MARKEL (reading). "It is not intended that the contractor will sell general commissary goods outside of uncooked goods and the articles mentioned, for the reason that there is a treaty obligation between the United States Government and the Panaman Government limiting the sale of commissaries to certain classes of employees."

Senator MORGAN. Have you ever seen any such treaty as that?

Mr. MARKEL. No; I have never seen it.

Senator MORGAN. Was any copy of it furnished to you by anybody?

Mr. MARKEL. No, sir.

Senator MORGAN. I have never heard of it before. I have no doubt that refers simply to the arrangement that Secretary Taft made, which was provisional and temporary.

Senator TALIAFERRO. The concluding paragraph of this letter to one of your competitors reads as follows:

"To be entirely frank, I fear from the prices you have made that you have not considered all the items mentioned in this letter, and that therefore your prices are lower than they otherwise would be. In order that there may be no misunderstanding, and because we do not wish to take any advantage, I sent you this communication and give you the privilege of revamping your figures in view of this letter, if you desire to do so." This is signed "D. W. Ross."

Senator KITTREDGE. Who signed your letter, Mr. Markel?

Mr. MARKEL. Chairman Shonts. President Shonts, I should say.

Senator TALIAFERRO. I will read from this affidavit.

Senator MORGAN. As president of the canal company?

Mr. MARKEL. No, sir; as president of the Panama Railroad Company.

Senator MORGAN. Was all this transaction carried on in the name of the railroad company?

Mr. MARKEL. Yes, sir.

Senator MORGAN. Was Mr. Cromwell engaged as counsel in advising about this transaction?

Mr. MARKEL. I did not see Mr. Cromwell until the day before I sailed for the Isthmus, the day that I gave them an agreement that they need not take the thirty days' time.

Senator MORGAN. Yes.

Mr. MARKEL. That they could cancel it at their pleasure.

Senator MORGAN. Was he there conducting or directing or advising about the matter?

Mr. MARKEL. Of this contract?

Senator MORGAN. Yes.

Mr. MARKEL. When it was let?

Senator MORGAN. Yes.

Mr. MARKEL. No, sir. I never saw Mr. Cromwell until the 22d of September.

Senator MORGAN. You saw him in New York?

Mr. MARKEL. Yes, sir.

Senator MORGAN. What connection had he with this business?

Mr. MARKEL. None up to the 22d of September.

Senator MORGAN. Prior to the 22d of September what connection had he with it?

Mr. MARKEL. None after that date.

Senator MORGAN. So that neither before that date nor afterwards had he any connection with it?

Mr. MARKEL. No; not as far as I know.

Senator MORGAN. Did he have any connection with it that you know of?

Mr. MARKEL. Not that I know of personally. I understand he is a director of the railroad—

Senator MORGAN. But he was not present and participating in any of these transactions—either the making of the contract or the cancellation of the contract or the amendment of the specifications?

Mr. MARKEL. He was not present at the making of the contract. He was present in Mr. Shonts's office the 22d of September when I reached New York prepared to go to the Isthmus.

Senator MORGAN. And that is the time the cancellation took place?

Mr. MARKEL. No, sir; that is the time the agreement was made that they could cancel it at their pleasure.

Senator MORGAN. At their pleasure?

Mr. MARKEL. Yes. It was not canceled until the 9th of October.

Senator MORGAN. When that agreement was made that they could cancel it at their pleasure, do you know whether Mr. Cromwell was present?

Mr. MARKEL. Yes, sir.

Senator MORGAN. And assisting?

Mr. MARKEL. And President Shonts and myself.

Senator MORGAN. And assisting in the arrangement?

Mr. MARKEL. He witnessed the letter that I gave Mr. Shonts.

Senator MORGAN. He witnessed it?

Mr. MARKEL. Yes.

Senator MORGAN. Did he prepare it?

Mr. MARKEL. I think he did.

Senator MORGAN. I was just inquiring because I did not know how it was possible for him to keep out of it all. [Laughter.]

Senator TALIAFERRO (reading). "We remained with Mr. Shonts until about 5 o'clock, at which time Mr. Ross, who was in the office all during the session, remarked that Mr. Jacob E. Markel, the other bidder, had not yet been heard from, although he had promised to submit his bid by 4 o'clock."

I understand you to say that is not true, Mr. Markel, as far as the delivery of your bid is concerned?

Mr. MARKEL. As far as I know.

Senator TALIAFERRO. That was September 6 at 5 o'clock?

Mr. MARKEL. Yes.

Senator TALIAFERRO. Your bid had been delivered prior to that time?

Mr. MARKEL. Yes, sir.

Senator KITTREDGE. You say "as far as you know?"

Mr. MARKEL. Yes, sir.

Senator KITTREDGE. Do you not know what time you filed your bid?

Mr. MARKEL. At noon on September the 6th.

Senator MORGAN. What do you mean by your statement "as far as I know?"

Mr. MARKEL. What I meant by that was that I did not know what Mr. Ross said. I have no way of knowing what Mr. Ross said. I understood the Senator to ask what Mr. Ross said.

(By request the stenographer read the question of Senator Taliaferro, as follows:)

"Senator TALIAFERRO (reading). 'We remained with Mr. Shonts until about 5 o'clock, at which time Mr. Ross, who was in the office all during the session, remarked that Mr. Jacob E. Markel, the other bidder, had not yet been heard from, although he had promised to submit his bid by 4 o'clock.'

"I understood you to say that is not true, Mr. Markel, as far as the delivery of your bid is concerned?"

Mr. MARKEL. It is not true as far as the delivery of my bid is concerned.

Senator TALIAFERRO. Do you recall what time you received this letter that you have just read to the committee from Mr. Shonts?

Mr. MARKEL. I should say about 1 o'clock; between 1 and 2 o'clock.

Senator TALIAFERRO. Continuing, this affidavit states [reading]:

"On the afternoon of the following day, September 7, Mr. Shonts notified us of the award of the contract to Mr. Markel, and extended to us the privilege of examining his bid. In reading the successful bid, we observed that it was dated September 6, while ours was dated September 5."

That seems to be true—that that bid was September 6?

Mr. MARKEL. Yes, sir.

Senator TALIAFERRO. Well, how was it that your bid was not delivered September 5?

Mr. MARKEL. Because Balfe & Co. had requested another day, and all of us were granted another day.

Senator TALIAFERRO (reading). "In reading the successful bid, we observe that it was dated September 6, while ours was dated September 5, and discovered, under the heading of 'Sample menus for one week,' the precise menus which we had prepared and submitted with our original bid."

Mr. MARKEL. Yes, sir.

Senator TALIAFERRO. How did you get hold of that menu?

Mr. MARKEL. I did not get hold of them.

Senator TALIAFERRO. Then that statement is not true?

Mr. MARKEL. I do not know. It may be true. Mr. Shonts asked all of us for a menu, and if he saw fit to use their menu—I submitted one with my bid, and if the original papers are looked at you will find it there.

Senator TALIAFERRO. Did you prepare your menu?

Mr. MARKEL. I certainly did, sir. I would not have to ask Mr. Hudgins—

Senator TALIAFERRO. And you did not submit any other than the one you prepared?

Mr. MARKEL. No, sir. I would not have to take Hudgins and Dumas to show me how to make up a menu.

Senator TALIAFERRO (continuing reading). "Mr. Shonts's secretary

at such time stated that he intended to take Mr. Markel's bid to Washington the same evening for filing in the office of the Commission.

"HOULDER HUDGINS.

"CHARLES J. DUMAS.

"Signed and sworn to before me this 20th day of September, 1905.

[SEAL.]

"JAMES COCHRAN,

"Notary Public, Kings County.

"Certificate filed in New York County."

Senator MORGAN. Will you allow me to ask a question on this paper before you proceed further?

Senator TALIAFERRO. Certainly.

Senator MORGAN. Not exactly on that, either, but on your statement made in connection with it.

Senator TALIAFERRO. Certainly.

Senator MORGAN. On a certain day you agreed that your contract, which had been already signed, might be so far modified as that they could cancel it at their pleasure?

Mr. MARKEL. Yes, sir.

Senator MORGAN. Was any promise or assurance given to you, in consideration of your making that agreement, that you should receive compensation or a stipend or reward or anything of the kind?

Mr. MARKEL. No. Would you like to know just the circumstances?

Senator MORGAN. I think it had better be stated just as it occurred.

Mr. MARKEL. Just as it occurred?

Senator MORGAN. Yes.

Mr. MARKEL. I arrived in New York September 22, about noon. I went to Mr. Shonts's office, and this was in accordance with an understanding that I had had with him when the contract was completed, that I would get sufficient men to New York and send them to the Isthmus to take charge of the two houses as quickly as possible. The contract was signed September 7. I left New York that night or the next morning, reached Chicago September 9, and on home and made my personal arrangements, and got my crew together and returned to New York September 22, prepared to go to the Isthmus. When I got to Mr. Shonts's office, he said to me: "There are some very disquieting telegrams. I do not know what is the matter." And he handed me a cablegram from Chief Engineer Stevens, which said that the Markel contract had created a great deal of dissatisfaction on the Isthmus; that it would necessitate the raising of the pay of all the employees on the Isthmus, and that it was a well-known fact on the Isthmus that if the Markel contract was carried out there was a million dollars a year clear profit in it. That was a pretty strong statement, and rather took all of our breath away. Mr. Shonts was considerably worked up over it, inasmuch as all the cablegrams and all the letters and everything else that had been coming to New York had been an appeal from Mr. Stevens and from everybody else to hurry up the hotel arrangements. It showed that something was radically wrong.

Senator MORGAN. Do you remember whether you knew who those cablegrams came from?

Mr. MARKEL. From John F. Stevens, the chief engineer.

Senator MORGAN. All of those?

Mr. MARKEL. They were signed by Mr. Stevens.

Senator MORGAN. They came from him?

Mr. MARKEL. Yes, sir; I saw the cablegrams.

Senator MORGAN. You had stated it, and I had omitted to remember it.

Mr. MARKEL. Yes, sir; those are the exact words, as nearly as I can remember them.

Senator MORGAN. I understand. You gave the substance of it.

Mr. MARKEL. Then Mr. Shonts said: "We had better not proceed any further on this matter. I have sent for our attorney, Mr. Cromwell, and he will be here in a few minutes," which he did. Mr. Shonts showed Mr. Cromwell the cablegram. He asked me if the terms of that contract could be changed, whether I could furnish a satisfactory meal for a less amount of money, and I told him no, that I could not do it. Well, then, he said: "I do not know what is the matter, but, Mr. President, you had better avail yourself of the thirty-day clause and give Mr. Markel notice now of your intention to cancel that contract. When you get on the Isthmus you can do as you please. That will put you in shape to cancel it in thirty days anyway." I then said: "Gentlemen, you need not take thirty days nor thirty minutes. You can cancel that contract when you see fit." I had not had a chance to put it in force, but my idea was that if they were going to cancel it in thirty days—

Senator MORGAN. That they had better cancel it then?

Mr. MARKEL. That they had better cancel it then; yes, sir. And I gave them a letter to that effect—that as far as the thirty-day clause was concerned I would waive any right that I had under it—as far as that particular clause was concerned.

Senator MORGAN. Was any promise made to you of any kind?

Mr. MARKEL. Not at that time; but there were promises made afterwards.

Senator MORGAN. How long afterwards?

Mr. MARKEL. On the Isthmus.

Senator MORGAN. On the Isthmus?

Mr. MARKEL. Yes, sir.

Senator MORGAN. I will not go into that now.

Senator TALIAFERRO. I see that in bidding you deal with the gold men and silver men in separate classes.

Mr. MARKEL. Yes, sir.

Senator TALIAFERRO. How do the proportions stand? How many gold men were there in comparison with the silver that would come under the operation of this contract?

Mr. MARKEL. Well, Senator, since the last few weeks I got together the original figures that are used in making up my bid. I, of course, had to have a unit to work from in making up an understandable bid, and I presume that there would be the first year two hotels for the gold roll and probably five camps of 200 each of the silver roll.

Senator TALIAFERRO. Very well. That would be 1,000 of the silver roll as against how many in the hotels for the gold roll?

Mr. MARKEL. I am going to say. The hotels would accommodate 150. The hotel at Culebra and the hotel at Corozal, that were up, had accommodations for 150 men. They have built on since then an

annex to each one of those hotels. That was the standard style of a hotel for 150 men each. I based my figures on the proposition that there would be 150 guests at the gold-roll houses and that there would be 200 of the silver roll in each camp, and that in all probability the first year five camps would be all that would be in operation, and that the second year there would be four hotels and 10 camps, and the third, fourth, and fifth year that there would be six hotels and 25 camps.

Senator TALIAFERRO. Practically maintaining the proportion that you started with?

Mr. MARKEL. Yes, sir.

Senator TALIAFERRO. So that your bid was based on the view that you would have about 300 gold men and about 1,000 silver men?

Mr. MARKEL. Yes, sir. Would you like to know what the gross receipts would be from those years?

Senator MORGAN. I would.

Mr. MARKEL. The gross receipts from the gold roll the first year would be \$129,600; from the 1,000 men of the silver roll, \$144,000. The second year—

Senator TALIAFERRO. You need not go into the second year. I want you to make a comparison for me.

Mr. MARKEL. All right.

Senator TALIAFERRO. Using your own percentages there as to the gold and silver men, I want you to tell me what this bid would have amounted to, putting it in juxtaposition to your own. [Handing to Mr. Markel the bid of Hudgins & Dumas.]

Mr. MARKEL. I would have to figure that all over, Senator. That is quite a job.

Senator TALIAFERRO. You had a short way of doing it in your own case, had you not?

Mr. MARKEL. Yes, sir; but I did not use these figures.

Senator TALIAFERRO. Just follow the policy that you pursued in making your own estimate and make up an estimate from those figures. I want the committee to see just exactly what the difference is between those bids.

Mr. MARKEL. Well, I would have to refer to my figures to see. I do not know what bid this is [reading]: "Maintenance and care of rooms, per month, persons over 12 years of age, \$3."

Senator TALIAFERRO. There is nothing of that sort included in your bid?

Mr. MARKEL. Yes, sir; I have it all figured out; every bit of it.

Senator MORGAN. According to the ages of the people?

Mr. MARKEL. Yes, sir; according to the ages of the people.

Senator TALIAFERRO. Mr. Markel, I want you to take those figures exactly as you have taken the figures of your own bid and tell this committee what that bid is under your management of your bid.

Mr. MARKEL. That is, what would be the earnings?

Senator TALIAFERRO. Yes; what would be the gross earnings to the contractor?

Mr. MARKEL. I could not do it here. There are too many figures.

Senator MORGAN. It will require time to work it out?

Mr. MARKEL. It certainly would. I have been two weeks working that out [referring to memorandum].

Senator MORGAN. Mr. Markel had better work out that proposition and put it in the record, then?

Senator TALIAFERRO. Do your figures there set it out clearly?

Mr. MARKEL. They certainly do.

Senator TALIAFERRO. Do they show the proportion of each?

Mr. MARKEL. For instance, in my figures here I figure the care of the rooms at \$6 a month. In that bid they are figured at \$3 a month. And for instance, "Maintenance and care of rooms per month per person over 5 years and under 12 years of age;" I have no such item.

Senator TALIAFERRO. That would be eliminated, then, from your figures?

Mr. MARKEL. Certainly. Here is "Meals per month per person over 12 years of age, \$14." My meals per month per person over 12 years of age were \$30. But this is not the last bid of Dumas's, is it?

Senator TALIAFERRO. It purports to be.

Mr. MARKEL. I think you will find that that bid was changed. I do not know. I would not like to undertake—

Senator TALIAFERRO. I will ask that I may have the statement that Mr. Markel holds in his hand, so that I can ascertain the method by which he has reached the results that he has stated here; and I will have it worked out myself, so that it can be put into the record.

The CHAIRMAN. There is no objection to handing that statement to Senator Taliaferro when you are through with it, I suppose, Mr. Markel?

Mr. MARKEL. No objection at all.

The CHAIRMAN. Very well. Hand it to the Senator when you are through with it.

Senator MORGAN. It is only a matter of calculation, at best.

Senator TALIAFERRO. That is all.

The CHAIRMAN. Hand it to the Senator when you have finished with it, Mr. Markel.

Senator MORGAN. Was this transaction about the feeding of the canal hands a matter of contract with the railroad company instead of with the Canal Commission?

Mr. MARKEL. I presume they thought that they could handle it better under the charter of the railroad than they could under any Commission laws.

Senator MORGAN. Yes.

Mr. MARKEL. One of the principal features was this: That under the management of the Commission it would have been impossible for them to have made deductions from the pay roll in favor of the contractor without some special legislation. I think there is a law that there can be no deductions made from the pay of an employee of the Government.

Senator MORGAN. That is to say, the paymaster can not pay anybody but the employee?

Mr. MARKEL. That is all. Under railroad management they are authorized to make deductions from the pay roll.

Senator MORGAN. Yes; and that would change the situation so that the hotel keeper or furnisher of the commissaries would be secured?

Mr. MARKEL. He would receive his pay; he would be secured, yes.

Senator MORGAN. Because he would get his money through the paymaster?

Mr. MARKEL. Yes, sir. That was absolutely necessary on the Isthmus, because the party who operated the Culebra Hotel in July told me that he only collected about 60 per cent of what was due him, because of the fact that he had no pay-roll protection.

Senator MORGAN. And it was, therefore, concluded that it was just to the hotel keeper, the commissary, as he is called, I believe?

Mr. MARKEL. Yes.

Senator MORGAN. That he should have a right to present his claims to the paymaster for board against these different individuals, and on pay day that claim was to be deducted from his pay; that is the situation?

Mr. MARKEL. Yes, sir.

Senator TALIAFERRO. Mr. Markel, you stated that you were invited to go to the Isthmus by Mr. Wallace?

Mr. MARKEL. Yes, sir.

Senator TALIAFERRO. What was the character of that invitation?

Mr. MARKEL. It was first given in April. I met him in Chicago, and he called my attention to a letter that he had written me from the Isthmus.

Senator MORGAN. That you had never received?

Mr. MARKEL. Yes, sir; that I had never received. It had miscarried, and I afterwards got it about the 1st of May. That letter is in the Secretary of War's report, in this Document No. 127.

Senator MORGAN. And is also in our files here.

The CHAIRMAN. Yes; we have it here.

Mr. MARKEL. When I saw him in Chicago, we talked the matter over. I did similar work for him before, when he was general manager of the Illinois Central, and I, after consulting with my family and my son, told him that I would go and look it over. Do you want to know what my idea was?

Senator TALIAFERRO. Yes.

Mr. MARKEL. My idea was that Mr. Wallace wanted that I should go there and look the matter over thoroughly and make a report to him, and if it could be arranged so that the matter could be let out to contract, I think perhaps I did think that I would perhaps be an applicant for that place. If not, it was my intention and expectation to give Mr. Wallace the best information that I had, and the information that I gathered together before going to the Isthmus, and to assist him in any way and all ways to make up an organization.

Senator TALIAFERRO. Did you go there with the feeling that there was an opportunity for you to make a profitable contract for yourself?

Mr. MARKEL. I went there with this feeling, first, to help Mr. Wallace out, and that he would treat me fairly, as he always had, and that if there was a chance to do it by contract I would be a possible bidder. I did not go there with the expectation of remaining on the Isthmus or that I would positively get the contract.

Senator TALIAFERRO. That is to say, you went there with the feeling that if there was anything to be gotten in the way of a profitable contract you would have a chance to get it, and if there was nothing of that kind, that Mr. Wallace would deal fairly by you, meaning, I presume, that you would be suitably compensated for your services?

Mr. MARKEL. Yes, sir.

Senator TALIAFERRO. So that you felt that in going there there was no possibility of loss on your part?

Mr. MARKEL. Why, no. I was not seeking for a summer jaunt, or to go down there for pleasure. I certainly meant business when I went there.

Senator MORGAN. Let me ask you, Was Mr. Wallace at that time acting as one of the Commissioners, or was he acting as an officer of the railway company?

Mr. MARKEL. He was acting in both capacities, then, Senator. He signed the letter as chief engineer, I think.

Senator MORGAN. I omitted to ask you one thing at the moment. You mentioned a cablegram that Mr. Stevens sent to Mr. Shonts, giving him information about the situation in the Isthmus, which I will characterize as a sort of clamor against the proposed establishment of commissaries there?

Mr. MARKEL. Yes, sir.

Senator MORGAN. And in which it was stated that the contract to be made with you would yield a million dollars a year profit?

Mr. MARKEL. Yes, sir.

Senator MORGAN. Did you understand at that time whether that clamor was raised by Panamans or by people connected with the government in the Zone?

Mr. MARKEL. Well, Senator, it seemed to me—I, of course, was here—

Senator MORGAN. Yes; you were here.

Mr. MARKEL. It seemed to me that it was caused partly by the employees' misunderstanding of it and partly by the Panamans and principally by Mr. Stevens not understanding the contract and not knowing the full contents of it.

Senator MORGAN. When you got down to the Isthmus did you ascertain that there was a demand on the part of the Panamans of a right to furnish commissaries in that Zone to the laborers or to board them?

Mr. MARKEL. When I was there the first time and the second time it was understood that through some arrangement the commissary benefits could not be extended to the silver roll.

Senator MORGAN. Yes; and that that would throw the control of it in the hands of the Panaman merchants?

Mr. MARKEL. Yes, sir.

Senator MORGAN. That was in character, if not in terms, a similar demand to that made in regard to the tobacco monopoly; that they had the control of things?

Mr. MARKEL. Yes, sir.

Senator MORGAN. And intended to insist upon it?

Mr. MARKEL. Yes, sir.

Senator MORGAN. That was your understanding of it?

Mr. MARKEL. Yes, sir. That was, of course, a part of the clamor.

Senator MORGAN. That was a very distinctive claim, was it not, on the part of the Panama merchants, that they should have the right to feed the silver men or else to sell them provisions?

Mr. MARKEL. I think they misunderstood the contract, the same as everybody else did.

Senator MORGAN. I do not speak of the terms of your contract, but I am asking about the general right. Did they claim the right in that

Isthmus to a monopoly—I will call it a monopoly—in the sale of provisions to the silver men?

Mr. MARKEL. Yes, sir.

Senator MORGAN. To the laboring people?

Mr. MARKEL. Yes, sir.

Senator MORGAN. They did not extend it to the higher grades of the gold men?

Mr. MARKEL. No, sir.

Senator MORGAN. But they claimed that as a part of their perquisites under the situation between Panama and the United States?

Mr. MARKEL. Yes, sir.

Senator MORGAN. Did that extend also to the sale of merchandise, ordinary dry goods, as well as of provisions?

Mr. MARKEL. I do not know; I think not, though. There were a number of stores there.

Senator MORGAN. In the Zone?

Mr. MARKEL. Yes, sir; that is, in Panama and Colon.

Senator MORGAN. There are plenty of them in Panama. Were there any stores of that kind in the Zone?

Mr. MARKEL. I rather think there were, in the little towns along the railroad.

Senator MORGAN. Were they in the hands of the Panamans?

Mr. MARKEL. Principally Chinamen, I think.

Senator MORGAN. How do the Chinamen rank down there, as Panamans, Americans, or what?

Mr. MARKEL. They rank with the best citizens.

Senator MORGAN. The best citizens?

Mr. MARKEL. Yes, sir.

Senator MORGAN. They take "potluck" with the Panamans in all their rights and privileges?

Mr. MARKEL. Yes, sir.

Senator MORGAN. And claim it?

Mr. MARKEL. I think they get it.

Senator TALIAFERRO. Mr. Markel, I notice here in the record a letter from the Isthmian Canal Commission, addressed to you at the Windsor, New York, as follows:

"DEAR SIR: Referring to the contract entered into to-day between the Panama Railroad Company and yourself, relative to the feeding of the employees of the Panama Railroad Company and the Isthmian Canal Commission on the Isthmus of Panama, and that portion of the contract which specifies that the same shall not be transferred by you without the written consent of the president of the railroad company, I beg leave to say that I understand it is your intention to organize a corporation to take the place of yourself as contractor under this agreement. This is to advise that when your corporation is complete and satisfactory to our counsel you will have my consent to substitute the corporation as contractor in place of yourself."

What steps did you ever take under the authority of that letter?

Mr. MARKEL. I organized a corporation.

Senator MORGAN. Where?

Mr. MARKEL. At Mr. Wadleigh's home, Pierre, S. Dak.

Senator MORGAN. A United States corporation? Have you got a copy of it there?

Mr. MARKEL. Yes, sir. I have the original incorporation papers here.

Senator MORGAN. I would like to see them a moment, if you please. (The papers referred to were handed to Senator Morgan.)

Senator TALIAFERRO. Did you ever issue any of the stock of the corporation?

Mr. MARKEL. Only to ourselves, sir. Mr. Wadleigh and myself subscribed to all the stock. It was simply made a corporation for our convenience.

Senator TALIAFERRO. Was there ever any understanding or agreement that any part of that stock should go outside of the parties then holding it?

Mr. MARKEL. No, sir.

Senator TALIAFERRO. None of it was to go to Mr. Shonts?

Mr. MARKEL. No, sir.

Senator MORGAN. Did you have any discussion of the subject with Mr. Cromwell?

Mr. MARKEL. No, sir.

Senator TALIAFERRO. You did not?

Mr. MARKEL. No, sir.

Senator TALIAFERRO. You did not have any discussion of the subject of your incorporation of a company with him?

Mr. MARKEL. You understand that that corporation was organized after the contract was made.

Senator TALIAFERRO. I understand.

Mr. MARKEL. That was done—I think it bears date either of about the 10th or 12th or 19th of September. I brought that with me to New York, and when we had the conference, when I signed that agreement to permit them to cancel the contract at their pleasure, that was the first time that I had ever seen Mr. Cromwell. These papers were lying on Mr. Shonts's desk at that time. I had brought them in that morning. That was in compliance with that agreement.

Senator TALIAFERRO. Did you not confer with Mr. Cromwell at all about the character of your corporation?

Mr. MARKEL. No, sir.

Senator TALIAFERRO. You note the language of Mr. Shonts here—"This is to advise that when your corporation is complete and satisfactory to our counsel," etc. Do you know whom he refers to there?

Mr. MARKEL. I do not, sir.

Senator TALIAFERRO. With that statement before you, you proceeded to organize this company without inquiring who the counsel was and what he would require?

Mr. MARKEL. Yes, sir. My idea was to have my own lawyer make out the papers, and to get the bond myself. You will notice in the contract that I had to furnish a bond of \$100,000, which I did; and I presented that bond and those incorporating papers to Mr. Shonts on September 22. I think he referred them—in fact, I know he referred them—to Mr. Cromwell.

Senator TALIAFERRO. But you had no conference with Mr. Cromwell on the subject at all?

Mr. MARKEL. None at all.

Senator TALIAFERRO. And there was no sort of understanding that Mr. Cromwell or Mr. Shonts or anybody connected with this company should have any interest whatever in your company?

Mr. MARKEL. Absolutely none. No man on earth had any interest in that contract but myself and my family and Mr. Wadleigh.

Senator TALIAFERRO. Who?

Mr. MARKEL. Mr. Wadleigh, my father-in-law. You will notice Mr. P. J. Partenan (?) there as one of the organizers. He is my brother-in-law, a son-in-law of Mr. Wadleigh, and my chief clerk and partner. It was entirely a family matter.

Senator TALIAFERRO. "Cash expended by J. E. Markel, P. L. Markel and secretary, traveling expenses, etc., up to September 19, 1905, \$1,550."

Mr. MARKEL. Yes, sir.

Senator TALIAFERRO. Did you keep an itemized account of those expenses?

Mr. MARKEL. No, sir.

Senator TALIAFERRO. How did you arrive at that result?

Mr. MARKEL. I put \$1,550 in money in my pocket, and when I got through I did not have any left.

Senator TALIAFERRO. You proceeded on the hypothesis that all you spent was in the interest of the Government?

Mr. MARKEL. All I spent was my expenses on that trip.

Senator MORGAN. You did not attend any dances down there in Panama, did you?

Mr. MARKEL. Yes; I did. [Laughter.]

Senator MORGAN. Are they expensive?

Mr. MARKEL. No.

Senator TALIAFERRO. Not to him, Senator.

Mr. MARKEL. No; there was not any of that \$1,550 that went into dances.

Senator TALIAFERRO. "Railroad fares, hotel bills, and traveling expenses of J. E. Markel and secretary, September 19 to October 19, 1905, \$290.35." How did you keep the account of that expenditure?

Mr. MARKEL. In the same way, sir; my secretary kept that.

Senator TALIAFERRO. "Paid Panama Railroad Company for four tickets, New York to Colon and return, \$160." You did not have transportation down there?

Mr. MARKEL. No, sir.

Senator TALIAFERRO. Did not Mr. Wallace testify that he gave you transportation to the Isthmus?

Mr. MARKEL. That was the first trip, sir.

Senator TALIAFERRO. This was the second trip?

Mr. MARKEL. This was the second trip.

Senator TALIAFERRO. Did that first item refer entirely to the first trip?

Mr. MARKEL. Every bit of it, sir.

Senator TALIAFERRO. And nothing to the second trip?

Mr. MARKEL. My expenditure from the 1st day of May until the 19th day of September was contained in that one item of \$1,550.

Senator TALIAFERRO. "For rent of New York office and settlement of cancellation of lease, which expired May 1, 1906, \$211.80." You intended to keep a New York office in connection with your commissary?

Mr. MARKEL. Yes, sir; I intended to keep a New York office and a storeroom in New York. My headquarters would have been in New York.

Senator TALIAFERRO. And the \$211.80 represents exactly what it cost you?

Mr. MARKEL. Exactly, sir—absolutely.

Senator TALIAFERRO. This entire list of expenses is made upon that basis?

Mr. MARKEL. Yes, sir.

Senator TALIAFERRO. It represents just what——

Mr. MARKEL. It represents actual cash paid out.

Senator TALIAFERRO. I notice among your paid employees the name of W. B. Millard.

Mr. MARKEL. Yes, sir.

Senator TALIAFERRO. "Salary, \$250; expenses, \$138.92." Who is this Mr. Millard?

Mr. MARKEL. W. B. Millard is the son of Senator Millard, the chairman of this committee—a young man whom I have known from childhood. I have been interested in business enterprises with him up to a few years ago.

Senator TALIAFERRO. Was Senator Millard a member of this committee at that time?

Mr. MARKEL. I do not know, sir.

Senator TALIAFERRO. You did not inquire?

Mr. MARKEL. No, sir.

Senator TALIAFERRO. You knew he was in the Senate?

Mr. MARKEL. Yes, sir.

Senator TALIAFERRO. What period of time does that salary of \$250 cover?

Mr. MARKEL. One month; and that was because the day before I left Omaha to go to New York, or, in other words, the 18th of September——

Senator TALIAFERRO. Was he an ordinary clerk in your service?

Mr. MARKEL. No, sir.

Senator TALIAFERRO. What was his relation?

Mr. MARKEL. I was going to explain that to you. Can I go on as I——

Senator TALIAFERRO. Certainly; explain it in your own way.

Mr. MARKEL. The day before I left Omaha, going to the Isthmus to assume charge of my contract, Mr. W. B. Millard came to my office. He had just come in a few days before that from Montana, where he had been in the mining business for about ten years. He said he had gotten up to the end of his string on the mine proposition, and that it was necessary for him to have something to do, and he proposed to go to the Isthmus with me.

Senator TALIAFERRO. Pardon me one moment. Your employment of Mr. Millard, then, was cotemporaneous with your entering into this contract with the Government?

Mr. MARKEL. My employment of Mr. W. B. Millard dates from the 18th day of September.

Senator MORGAN. That is, nine days after you made the contract?

Mr. MARKEL. Eleven days after making the contract; and it was a complete surprise to me, as well as a gratification, to be able to get as able a man as he was to act as chief clerk and in charge of my matters on the Isthmus. He was a young man very familiar with the banking business, having been ten or fifteen years before that vice-

president of the Omaha National Bank, resigning that position to go into the mining business. As I said before, he had "got to the end of his string" on the mine, and wanted something to do; and I hired him at \$3,000 a year and his expenses.

Senator TALIAFERRO. Were you in the habit, Mr. Markel, of paying your chief clerk as much as \$250 a month?

Mr. MARKEL. Yes, sir—in the United States, too; and I should have paid him more than that upon the Isthmus.

Senator TALIAFERRO. Are you acquainted with Mr. Paul Morton?

Mr. MARKEL. Yes, sir.

Senator TALIAFERRO. How long have you known him?

Mr. MARKEL. Well, I never knew him intimately. I knew his father for forty years—ever since I went to Nebraska.

Senator TALIAFERRO. Have you discussed with him the situation on the Isthmus at all—the possibilities of business enterprises there, or things of that nature?

Mr. MARKEL. Mr. Paul Morton?

Senator TALIAFERRO. Yes.

Mr. MARKEL. No, sir.

Senator TALIAFERRO. You spoke of incorporating this company under the laws of Nebraska—was that it?

Mr. MARKEL. Dakota.

Senator TALIAFERRO. I suppose all the expenses of that incorporation were borne by you?

Mr. MARKEL. Yes, sir.

Senator TALIAFERRO. It cost the Government nothing?

Mr. MARKEL. No, sir.

Senator TALIAFERRO. I understood you to say, Mr. Markel, that you did not recall being in Mr. Ross's office at any time when other bidders were discussing with him the details of this proposed contract?

Mr. MARKEL. No, sir; that is, previous to the letting of the contract, do you mean?

Senator TALIAFERRO. Yes.

Mr. MARKEL. No, sir. I remember, on the evening or afternoon of September 7, after the contract was signed and delivered, of sitting in the office, getting ready to go away, and that one of the other bidders was in the office, having come in to get some papers. Which one it was I do not know. I remember now that one of them was there. This was September 7, after the contract had been signed and delivered.

Senator MORGAN. At the time that you entered upon this enterprise, when Mr. Wallace was on the Isthmus, until you got through here, about how much of your time was occupied in this business?

Mr. MARKEL. Every moment of it, Senator.

Senator MORGAN. About how long was it?

Mr. MARKEL. From the 1st of May until the 8th day of November.

Senator MORGAN. November?

Mr. MARKEL. Yes, sir.

Senator MORGAN. That was the business you transacted during all of that time?

Mr. MARKEL. That was the business I transacted, to the detriment of all other enterprises that I was interested in. I dropped everything.

Senator MORGAN. You gave your time to it?

Mr. MARKEL. I gave my time to it, absolutely—not only my own time, but my secretary's time, and my son was on the Isthmus with me about a month.

Senator KITTREDGE. When did you put the \$1,550 you mentioned in your pocket?

Mr. MARKEL. Oh, at different times, sir.

Senator KITTREDGE. Did you start out the 1st of May with that amount?

Mr. MARKEL. I started out the 1st of May with \$500 in money, a draft for \$500, and a draft for \$200. Those I took to the Isthmus with me.

Senator KITTREDGE. When did you go to the Isthmus first?

Mr. MARKEL. I sailed on June 26.

Senator KITTREDGE. How much money had you in your pocket at that time?

Mr. MARKEL. I had \$500 in money and two drafts—one of \$500 and one of \$200. Then I afterwards replenished my pocketbook as I needed.

Senator KITTREDGE. One thousand two hundred dollars in all?

Mr. MARKEL. One thousand two hundred dollars; yes, sir.

Senator KITTREDGE. Afterwards to what extent did you replenish your pocket?

Mr. MARKEL. From time to time.

Senator KITTREDGE. In what amounts?

Mr. MARKEL. One hundred dollars at a time.

Senator KITTREDGE. In what amounts?

Mr. MARKEL. A hundred dollars at a time.

Senator KITTREDGE. The total amount, I mean?

Mr. MARKEL. One thousand five hundred and fifty dollars.

Senator KITTREDGE. You started for the Isthmus on the 26th of June with \$1,200 in your pocket?

Mr. MARKEL. Yes, sir.

Senator KITTREDGE. And you replenished it thereafter from time to time?

Mr. MARKEL. Yes, sir.

Senator KITTREDGE. How much of the remaining \$350 did you add to your money supply?

Mr. MARKEL. How much did I add?

Senator KITTREDGE. Yes.

Mr. MARKEL. All of it.

Senator KITTREDGE. How much did you expend prior to the time you sailed for the Isthmus?

Mr. MARKEL. I do not know; I kept no account of it.

Senator KITTREDGE. About how much?

Mr. MARKEL. I could not give you any idea.

Senator KITTREDGE. Had you entered into any obligations prior to the time you sailed for the Isthmus?

Mr. MARKEL. Other than this business?

Senator KITTREDGE. Any obligations in regard to help, in regard to supplies, or anything of the sort?

Mr. MARKEL. Nothing except what pertained to this trip.

Senator KITTREDGE. Of a personal character?

Mr. MARKEL. Yes, sir.

Senator KITTREDGE. Did you have a talk with Mr. Wallace before you sailed on that first trip?

Mr. MARKEL. Yes, sir.

Senator KITTREDGE. Where was that?

Mr. MARKEL. At a hotel in New York—the Hotel Marie Antoinette.

Senator KITTREDGE. Do you remember the date?

Mr. MARKEL. Yes, sir; the morning of June 23.

Senator KITTREDGE. State the conversation had with him at that time.

Mr. MARKEL. On my way from Omaha to New York to go to the Isthmus I noticed in the papers the statement that Mr. Wallace had left the Isthmus and that it was rumored that he had resigned. When I got to New York I learned that he had just arrived. I got to New York about 6 o'clock in the evening, and along about 9 o'clock that evening I learned that Mr. Wallace had arrived and was at the Hotel Antoinette. I went up there the next morning and met him. I asked him if—shall I go on and tell what happened?

Senator KITTREDGE. Certainly. That is what I wish to know.

Mr. MARKEL. I asked him if he was going to quit. I said I had noticed in the papers a good deal of talk about his leaving, and he began to talk about the weather and other things: and, finally, I said: "Well, now, Mr. Wallace, if you are going to quit, do you think I had better go to the Isthmus? I am here, according to our agreement and arrangement. I have got my son's passage with me. My clerk's passage is all engaged. Had I better go on to the Isthmus?" He asked me if I was afraid of the yellow fever there. I told him no, I had had some experience in that. "Well, then," he said, "I think you had better go. It will make a nice trip for you, and whether I am there or not you can go over the ground, make your report to Governor Magoon, as you know him very well, and then, when you get through there and come back to the States, bring a letter of introduction to Mr. Shonts. You need not bring any letter to me, because I know all about it."

With that understanding I went on with my preparations, and intended to sail the next day; but the boat was delayed and did not leave until the following Monday, which was June 26.

Senator TALIAFERRO. What was the period of time from your going first to the Isthmus until your contract was finally canceled?

Mr. MARKEL. Finally canceled?

Senator TALIAFERRO. Yes.

Mr. MARKEL. Four months.

Senator TALIAFERRO. Four months?

Mr. MARKEL. About that. I left home the 19th of June to go to the Isthmus first. The contract was canceled the 9th of October. That would lack nine days of being four months, would it not?

Senator TALIAFERRO. This \$5,745.97 covered your total expenditures in that time?

Mr. MARKEL. Yes, sir; for the cancellation of the bond, the settlement with the purchasing agent, the traveling expenses, the first trip to the Isthmus, and the arrangement that I made for my employees, getting them to New York and returning them home, all such as I could not use in New York. About one-half of these men that I

had in New York—one-half of them, anyway—I put to work in New York; that is, there were three of four of them——

Senator TALIAFERRO. So that your experience down there, in all respects, cost you \$5,745.97?

Mr. MARKEL. Actual cash expenditures.

Senator TALIAFERRO. And the difference between that and the amount you received from the Government was given you for this less than three months' service of yours?

Mr. MARKEL. No, sir.

Senator TALIAFERRO. What was that for?

Mr. MARKEL. For six months' service.

Senator TALIAFERRO. You stated three, less than three. I asked you the question distinctly.

Mr. MARKEL. You asked me what time expired between my leaving for the Isthmus and the final cancellation. Now, there was over six weeks' time spent before that, before I went to the Isthmus, in getting together plans and specifications for refrigerator plants, laundries, bakeries, furniture, and equipment of all kinds necessary for the operation of the building.

Senator TALIAFERRO. Those expenses, where they cost you anything, were included in the \$5,700?

Mr. MARKEL. In the \$5,700 and whatever it is—all my expense.

Senator TALIAFERRO. So that the difference between that amount and the amount the Government paid you, which was \$10,000——

Mr. MARKEL. Ten thousand seven hundred and fifteen dollars, I think. Here it is, right here.

Senator TALIAFERRO (continuing). Was for services you rendered in connection with a contract you expected to make with this Government and out of which you expected to make money?

Mr. MARKEL. No, sir.

Senator TALIAFERRO. What was it for, then? State it in your own way.

Mr. MARKEL. It was \$5,745.97 for cash expended by me for a visit to the Isthmus in accordance with my understanding and a letter of Mr. Wallace——

Senator TALIAFERRO. Let me stop you there now, Mr. Markel. Can you produce the letter from Mr. Wallace giving you to understand that your expenses would be paid?

Mr. MARKEL. No, sir.

Senator TALIAFERRO. You said "in accordance with my understanding with Mr. Wallace."

Mr. MARKEL. No, no; my visit to the Isthmus in accordance with the letter—I was going on to explain. Now, then, as soon as I decided to go I began to get the information together that I knew Mr. Wallace would want. Now, I spent not all or every minute of the six weeks, but I spent a great deal of that time in getting this information. I called to my service the different experts throughout the country and visited different plants. Where I did not thoroughly know about a thing I found out. I have had a good deal of experience in refrigeration and I used what knowledge I had. When I got ready, in June, I took this information with me, with the expectation of turning it over to Mr. Wallace on the Isthmus.

Senator TALIAFERRO. Did you expect any pay for it?

Mr. MARKEL. I expected that I would be treated fairly; if I used my time and money that I would certainly be reimbursed for it.

Senator TALIAFERRO. Mr. Markel, did you expect any compensation beyond your actual expenses where a contract was given you by the Government?

Mr. MARKEL. I expected, if I got a contract, that for business reasons I would not present a bill.

Senator TALIAFERRO. Did you ever present a bill besides this?

Mr. MARKEL. No, sir.

Senator TALIAFERRO. Your bill was \$5,745.97, and the railroad company paid you ten thousand seven hundred and some dollars?

Mr. MARKEL. Yes, sir.

Senator TALIAFERRO. So they paid you without any solicitation on your part—

Mr. MARKEL. No, sir.

Senator TALIAFERRO (continuing). Practically \$5,000 in excess of the bill you rendered?

Mr. MARKEL. No, sir. In my conversation with the officials, when I presented my bill of expenses, I, in view of the contract not being carried out, through no fault of mine, told them that I thought I ought to be reimbursed for my time; that I had given up profitable contracts on railroads that I might devote myself to this business; that I had spent a great deal of time and a whole lot of money, and I thought that I ought to be paid back what money I had paid out, and that I ought to be paid for my service.

Senator TALIAFERRO. The minutes of the meeting of the board of directors of the Panama Railway Company on November 8, 1905, state that—

“After considering all the aspects of the case with Mr. Markel, the latter had agreed to the cancellation of the contract previous to its becoming effective, and without any obligation on the part of the company to reimburse him either for his services or his actual expenses, which latter amounted to \$5,745.97.”

Is that a true statement of the understanding under which you consented to the cancellation of your contract?

Mr. MARKEL. No, sir; the reason why I consented to the cancellation of the contract was because of the disquieting telegrams from the Isthmus, for the reason that it would be impossible for me or any other contractor to carry out the contract if he had the general manager of the railroad on his neck and his assistants cutting his bowels out. That is why I consented that it could be canceled in one minute or one day.

Senator TALIAFERRO. In other words, after ascertaining the conditions and the circumstances down there, you regarded it to your interest to cancel that contract at once?

Mr. MARKEL. No, sir; I did not. I regarded it as fair between man and man to put it into Mr. Shonts's hands to cancel it if he wanted to, but I was perfectly willing to carry out my contract if he would put it in shape, so that I had a responsible man to deal with.

(At the request of Senator Taliaferro, the stenographer read aloud the following answer of Mr. Markel:)

“No, sir. The reason why I consented to the cancellation of the contract was because of the disquieting telegrams from the Isthmus,

for the reason that it would be impossible for me or any other contractor to carry out the contract if he had the general manager of the railroad on his neck and his assistants cutting his bowels out. That is why I consented that it could be canceled in one minute or one day."

Senator TALIAFERRO. And after making that statement under oath. Mr. Markel, you say you did not regard it to your interest to cancel that contract at once?

Mr. MARKEL. No, sir; I did not.

Senator TALIAFERRO. How do you reconcile the two statements?

Mr. MARKEL. I reconcile the statements because I knew before I made my bid whether it was a profitable contract or not.

Senator TALIAFERRO. Did you take into account the difficulties to which you referred in your testimony a moment ago?

Mr. MARKEL. No, sir; I did not.

Senator TALIAFERRO. Would not those circumstances enter into the question of profits, as material factors?

Mr. MARKEL. Not if the contract had been put in force.

Senator TALIAFERRO. I am willing as to that point, Mr. Markel, that the public shall decide whether or not those two statements are consistent; whether, believing the facts that you have testified to—the disquieting conditions on the Isthmus, the attitude of the railway management and others—that no contractor could carry out the contract "with his bowels being cut out"—I think that was the expression you used—

Mr. MARKEL. Well, I did not mean that; you can change that.

Senator TALIAFERRO. That is what you said, Mr. Markel.

Mr. MARKEL. Yes; I said that.

Senator TALIAFERRO. I will leave the public to decide whether or not you regarded it to your interest to consent to the cancellation of that contract at once.

As a matter of fact, what period of time was covered between your first starting from your home in Nebraska to the Isthmus, and the cancellation of your contract?

Mr. MARKEL. Physically to go to the Isthmus?

Senator TALIAFERRO. No; what period of time elapsed between your starting from your home for the Isthmus and the cancellation of your contract?

Mr. MARKEL. There was a period of about six months from the time I commenced work, preparing to go to the Isthmus, up to the time the contract was canceled.

Senator TALIAFERRO. When did you have the interview with Mr. Wallace in Chicago?

Mr. MARKEL. About the 20th of April.

Senator TALIAFERRO. Was that the first?

Mr. MARKEL. Yes, sir.

Senator TALIAFERRO. That was the beginning of your connection with this work?

Mr. MARKEL. Yes, sir.

Senator TALIAFERRO. And your contract was canceled when?

Mr. MARKEL. October 9.

Senator TALIAFERRO. You say that is about six months? I have not computed it.

Mr. MARKEL. I think so.

Senator TALIAFERRO. So that you got from this Government practically \$5,000 in addition to all your expenses?

Mr. MARKEL. Yes, sir.

Senator TALIAFERRO (continuing). As a contractor with the Government for the six months' period, or the time, whatever it was?

Mr. MARKEL. I got \$5,000 for six months' service; yes, sir—expert service.

Senator TALIAFERRO. Expert service?

Mr. MARKEL. Yes, sir.

Senator DRYDEN. A little over \$4,200, was it not? You got \$10,000 even from the Government, and you disbursed fifty-seven hundred and odd dollars?

Mr. MARKEL. I got \$10,745.

Senator DRYDEN. Oh, I beg pardon; I did not hear that.

Mr. MARKEL. I got \$10,745.97.

Senator DRYDEN. It was practically \$5,000?

Mr. MARKEL. Yes, sir.

Senator TALIAFERRO. What were these difficulties which you encountered with the railroad people on the Isthmus that you referred to a moment ago?

Mr. MARKEL. These disquieting telegrams?

Senator TALIAFERRO. No; the conditions, the difficulties you had with the railroad people.

Mr. MARKEL. Well, when I got to the Isthmus in the meantime they had been operating these hotels and claimed that they were feeding the people, the gold men, at \$27.50 a month. My bid was \$36. They were feeding them, and their claim that it was only costing \$27.50 a month was incorrect, because they had not charged in a large amount of expenses that, as a contractor, I would have had to pay. Shall I go on and finish up?

Senator TALIAFERRO. Oh, yes.

Mr. MARKEL. We had a good many conferences about it. Mr. Stevens thought he was right, and I made a trip the second time I was on the Isthmus at the request of Mr. Shonts. I took an auditor and Mr. Jackson Smith, who had charge of the houses, and I went out to the houses and checked them over, and we found that it was costing them 30 cents a meal, a little over 30 cents, or \$27.50 a month to feed the people, and they had only charged about two-thirds of the pay roll to the expense account. For instance, the pay of the manager, who drew a salary of \$150 a month, and the hotel clerk, who drew a salary of \$125 a month, was carried on another roll. It was not carried on the roll or expense of the hotel.

The CHAIRMAN. Right there, if Senator Taliaferro will allow me, do you know what the actual cost is of feeding those men at the present time? Do you know what it is costing the Panama Railway Company to feed those people?

Mr. MARKEL. Yes, sir; I know approximately.

Senator TALIAFERRO. State it, Mr. Markel.

Mr. MARKEL. About \$40 a month.

Senator TALIAFERRO. They estimated it at \$27?

Mr. MARKEL. They estimated it at \$27.50, and they were only getting \$25.

Senator TALIAFERRO. You stated, as I recall, Mr. Markel, that this statement which I read to you from the minutes of the directors'

meeting of the Panama Railway Company of November 8, did not correctly set up the facts as to your consenting to cancel that contract?

Mr. MARKEL. Why, no; because I had consented to the cancellation of that contract long before this.

Senator TALIAFERRO. I do not mean as to the time, Mr. Markel; I mean as to the statement that you did it without the promise of reward—"without any obligation on the part of the company to reimburse him either for his services or his actual expenses, which latter amounted to \$5,745.97."

I understood you to say that that did not truly, correctly state the facts?

Mr. MARKEL. Well, what I meant by that was this: In the interview between Mr. Shonts and myself before we went to the Isthmus, in September, he showed me these telegrams, and I said: "What do you want to do? Now, I have this contract. I have not any desire to embarrass you or anybody else. Now, I will do whatever you say. I will depend upon your being fair." Then was when he called in Mr. Cromwell as a lawyer, and the matter was submitted to him, and this agreement was drawn up, and I signed it.

Senator TALIAFERRO. As a matter of fact, Mr. Markel, were you not apprehensive about having this contract on your hands from the moment that you met Mr. Wallace and understood from him that he was going to quit the service?

Mr. MARKEL. No, sir; no, sir. If I had I should not have gone to the Isthmus.

Senator TALIAFERRO. Did you not ask him whether you had better go or not?

Mr. MARKEL. Yes, sir.

Senator TALIAFERRO. Did you not have doubt in your mind as to the wisdom of your going?

Mr. MARKEL. As to the wisdom of my going to an entire stranger. What was in my mind was that if Mr. Wallace was going to leave, that new men would be put in charge, and those new men not knowing me and all my talk that I had had with Mr. Wallace, there was not anybody knew anything about it but him—I did not know Mr. Shonts; Mr. Stevens had not appeared on the scene. This conversation with Mr. Wallace in New York was before his interview with Secretary of War Taft. I knew nothing about that.

No, sir; I never had a particle of doubt about that contract. I absolutely know that it was a profitable contract, and I should have been very glad to have carried it out, but I wanted to carry it out under Mr. Shonts's instructions, and not under anybody else's.

Senator TALIAFERRO. There was too much red tape down there for you?

Mr. MARKEL. Yes, sir.

Senator TALIAFERRO. Did you find any conflict of authority between the representatives of the Government on the Isthmus?

Mr. MARKEL. None at all.

Senator TALIAFERRO. Where was the difficulty in dealing with them?

Mr. MARKEL. Well, we were right up against the proposition, and Mr. Stevens objected to it being put in force; and when we got to the Isthmus, in conversation with Mr. Stevens, Mr. Shonts, and Governor Magoon, Mr. Stevens still adhered to his idea that they were doing

it for \$27.50 a month, and were getting \$25, and that as time went by they could do it for less. He took his reports as he got them, I presume, and his men that were handling it did not know their business, and for that reason it was costing more than he claimed. I knew it was costing more.

Senator TALIAFERRO. More than Mr. Stevens claimed?

Mr. MARKEL. Yes, sir. I knew that I could operate it with the organization that I had and make money out of it at \$36.

Senator TALIAFERRO. I noticed in the beginning of this hearing, Mr. Markel, that the Senator read his questions from manuscript, and that you appeared to reply from manuscript. Had there been any comparison of his questions and your answers, or any consultation over them, before you came before the committee to testify?

Mr. MARKEL. I do not know, sir.

Senator TALIAFERRO. You do not know. You do not know whether you consulted about this testimony before you gave it?

Mr. MARKEL. Why, I certainly talked the matter over.

The CHAIRMAN. I will say to you, Senator Taliaferro, that I submitted my questions to Mr. Markel, and I told him that those were the questions I was going to ask him. I will say that I did submit those to him.

Senator TALIAFERRO. Did you take the questions which the chairman states he submitted to you and prepare your answers in accordance with them?

Mr. MARKEL. In a short way; yes. I made memorandums so as to remind me. I am an extremely forgetful man, and I did it.

Senator TALIAFERRO. As a matter of fact, have you not before you there complete answers to every one of his questions?

Mr. MARKEL. No, sir; I have not. I have them in a brief way.

Senator TALIAFERRO. Do you object to filing that paper with the committee?

Mr. MARKEL. I do.

Senator TALIAFERRO. You do object to it?

Mr. MARKEL. Yes.

Senator TALIAFERRO. Mr. Chairman, I move that the witness be required to file that statement with the committee.

The CHAIRMAN. I do not see that there is any objection to his filing it.

Senator TALIAFERRO. He says he objects.

The CHAIRMAN. Well, perhaps he would like to look it over. If he has only made memoranda perhaps he would like to make it complete. So far as I am concerned—

Mr. MARKEL. Well, I will complete it here with the stenographer, if you wish. Where it is incomplete I will complete it in his presence and turn it over to him.

The CHAIRMAN. You need not complete it in my presence; you can complete it in the Senator's presence.

Mr. MARKEL. Well, I suggested that because—

Senator TALIAFERRO. I move, Mr. Chairman, again, that the witness be required to turn that paper in his hands over to the stenographer, to be incorporated in the minutes of this meeting.

Mr. MARKEL. It is not necessary to take a vote on that. If you will permit me to correct the grammar, etc., I will turn it over.

Senator TALIAFERRO. I do not want any corrections, Mr. Markel. I wish the paper as it is. You can correct your testimony after it is prepared.

Mr. MARKEL. All right, sir.

Senator TALIAFERRO. I want the paper, I have no objection to stating, to ascertain whether or not that is not a carefully prepared reply to the questions submitted by the chairman of the committee, which Mr. Markel says is not the case.

Mr. MARKEL. I said it was a résumé, a brief; it is not a complete reply.

Senator TALIAFERRO. Your testimony shows what you said, Mr. Markel.

Mr. MARKEL. Yes, sir. Do you want it now?

(Mr. Markel thereupon handed the above-mentioned paper to the stenographer, and the same will be found at the end of to-day's proceedings.)

Senator TALIAFERRO. Mr. Chairman, I have no more questions to ask the witness at this time. I would like to have the privilege of going over these papers, with a view to determining, by morning, whether I desire to ask further questions or not.

The CHAIRMAN. This witness would like to get away, and if we could finish with him this evening it would be desirable.

Senator TALIAFERRO. You understand, Mr. Chairman, that these papers have come into my possession since 2 o'clock. This witness came on the stand at 2, and I have necessarily gone over them very hurriedly. I do not know that I shall wish to ask the witness any further questions in relation to them, but I shall expect the committee to give me the privilege of asking further questions if I desire it after going through these papers carefully.

Senator KITTREDGE. I think the Senator is entitled to it.

The CHAIRMAN. That is true.

Senator KITTREDGE. Mr. Markel, give the names of the railway officials with whom you talked regarding the bill that you presented to the committee.

Mr. MARKEL. My principal talk was with President Shonts.

Senator KITTREDGE. What other official, if any, did you have conversation with?

Mr. MARKEL. I think General Ernst, perhaps. I do not remember whether I had a personal talk with him or not.

Senator KITTREDGE. Any other official?

Mr. MARKEL. General Harrod was on the boat going down and returning from the Isthmus the last trip.

Senator KITTREDGE. You do not understand my question. You stated that you had conversations with the railway company officials regarding the merits of the bill which you presented to the company for services and expenses on account of your contract.

Mr. MARKEL. Yes. Well, that talk was with President Shonts.

Senator KITTREDGE. Where?

Mr. MARKEL. In New York.

Senator KITTREDGE. When?

Mr. MARKEL. Well, at different times from our return from the Isthmus up to the time I was paid the bill.

Senator KITTREDGE. And you returned from the Isthmus on what date?

Mr. MARKEL. We reached New York the 17th of October.

Senator KITTREDGE. And the bill was presented November 8?

Mr. MARKEL. November 8; yes, sir. Begging your pardon, the bill was presented, I think, October 21, but there was no meeting of the board of directors until November 8.

Senator KITTREDGE. And all the conversation that you had regarding the merits of this bill was with Mr. Shonts?

Mr. MARKEL. Yes, sir; yes, sir.

Senator KITTREDGE. You stated, in answer to a question by Senator Morgan, that there was no understanding with anyone regarding consideration for the cancellation of the contract at the time you gave the letter to the railway company. Is that right?

Mr. MARKEL. No, sir; there was no talk.

Senator KITTREDGE. Did you have any conversation or understanding with any official after that time regarding the compensation that you were to receive for services and expenses if the contract were canceled?

Mr. MARKEL. No, sir; no, sir. In my talk with President Shonts—

Senator KITTREDGE. Is that the conversation to which I have called your attention?

Mr. MARKEL. Yes, sir. In my talk with President Shonts in regard to the matter, while nothing definite was done—nothing definite was decided—I told him that I certainly should be paid what money I had paid out, and that whatever they gave me besides that I would be satisfied with. But I had in mind that they would pay me a thousand dollars a month, or \$6,000. That was the impression that I left in my talk with him.

Senator KITTREDGE. When was the contract in fact canceled?

Mr. MARKEL. The 9th day of October.

Senator KITTREDGE. At the Isthmus?

Mr. MARKEL. At the Isthmus, in Panama.

Senator KITTREDGE. In what manner?

Mr. MARKEL. There was a meeting—as I told you before, we discussed this thing on the Isthmus a great deal. On a Sunday, October 8, I had an interview with Mr. Stevens, Mr. Shonts, and Governor Magoon at the governor's house, and we discussed the matter pretty thoroughly. Mr. Stevens seemed to be satisfied with the way the silver men were being taken care of, and I told him that I thought it a shame to feed them that way, but if that was satisfactory, if it was satisfactory to the silver roll and satisfactory to the managers, I could feed them for 10 cents a meal, or 30 cents a day, the price that they were doing it at.

Furthermore, in the discussion, we talked about the gold roll; and I said to him: "If you will put me in the same position that you are now—not charge me for coal, not charge me anything for freight, put me in the same position that you are now—I will feed your gold-roll men at \$30 instead of \$36 a month."

They discussed that a little bit; and finally Mr. Stevens and Mr. Shonts went away, and we made an appointment for the next morning. I went to the office and sat around there for an hour or so, and finally Governor Magoon came out of one of the offices and said: "Markel, we have decided to cancel that contract." He said: "Mr. Stevens insists that he can feed these men for that price, and for

that and other reasons we have decided to cancel it, but Chairman Shonts will tell you." Just then Chairman Shonts, or President Shonts, came out, and he told me the same thing; and a short time after that I got a written notice that they would avail themselves of the privilege and cancel the contract.

Senator KITTREDGE. The privilege of exercising the option given them in that letter that you have mentioned?

Mr. MARKEL. Yes, sir; yes, sir.

Senator KITTREDGE. That was the 9th day of October?

Mr. MARKEL. Yes, sir.

Senator KITTREDGE. When did you leave the Isthmus?

Mr. MARKEL. The 11th day of October.

Senator KITTREDGE. You have spoken of the manner in which the meals were being served under the administration of Chief Engineer Stevens.

Mr. MARKEL. Yes, sir.

Senator KITTREDGE. What had you in mind in making your answer that if you were permitted to perform service in that manner you would be willing to take a less price?

Mr. MARKEL. Well, in my contract I was required and expected to feed them in a human way. The way they were feeding them down there, they had some large kettles, what we call out on the farm "farmers' kettles," big iron kettles, which sit out in the yard with a fire under them. There was put into these large kettles whatever they had to cook—yams and beans and meat and everything were dumped in there and cooked up, stirred up just the same as we do for our hogs out on the farm. The only difference I could see between the way they fed those negroes and the way I feed my hogs is that the food was put on a tin plate instead of in a trough. It seemed to be perfectly satisfactory to them, though. They seemed to be happy and content.

Senator TALIAFERRO. Were you on the Isthmus when the trouble occurred in the streets of Panama between some of the laborers and the Panaman police?

Mr. MARKEL. No; that was before I went down there, sir.

Senator TALIAFERRO. Do you happen to know about that?

Mr. MARKEL. Only as it was told me.

Senator TALIAFERRO. That, you understand, grew out of complaint about the food?

Mr. MARKEL. Yes, sir; that is what they told me while I was there.

Senator TALIAFERRO. And you understood, did you, that the assault on those negroes was entirely unprovoked?

Mr. MARKEL. Well—

Senator TALIAFERRO. Was that the feeling?

Mr. MARKEL. Yes; that was the feeling. I do not know anything about it, and, in fact, I did not hear it discussed.

Senator TALIAFERRO. You understood that these negroes were brutally treated for merely complaining of the character of the food that was given them?

Mr. MARKEL. Well, they said so. I do not know anything about it.

Senator TALIAFERRO. I say, you understood it from what you heard there?

Mr. MARKEL. Yes, sir.

Senator KITTREDGE. At the time the contract was canceled did Mr. Shonts or Judge Magoon give you any promise of compensation?

Mr. MARKEL. Yes, sir; both of them.

Senator KITTREDGE. State what was said.

Mr. MARKEL. Governor Magoon, in his talk with me, said that when they had decided to cancel the contract Mr. Stevens spoke up and said, "Now, Markel has rendered us valuable service here. He has done a great deal of work, and he ought to be paid for his expenses and service." When Chairman Shonts came out he repeated that. Now, I was not present at the meeting when the contract was canceled. That was held behind closed doors.

Senator KITTREDGE. Was anything said to you regarding the amount you should receive?

Mr. MARKEL. No, sir.

Senator KITTREDGE. For compensation.

Mr. MARKEL. No, sir; no amount was mentioned.

Senator KITTREDGE. Or was anything said about reimbursing you for the expenses you had incurred?

Mr. MARKEL. Yes, sir. It was talked that they would reimburse me for my expenses and services, "and that liberally" were the words that Mr. Stevens used, as I was told. I did not hear him say it.

Senator KITTREDGE. Did Mr. Shonts or Judge Magoon mention the word that Stevens is reported to have said in the conference?

Mr. MARKEL. Yes, sir; both of them.

Senator TALIAFERRO. You stated that you met Mr. Wallace in Chicago?

Mr. MARKEL. Yes, sir.

Senator TALIAFERRO. You undertook to state the date, I think, Mr. Markel.

Mr. MARKEL. Yes; it was some time between the 20th and the latter part of April. I do not know the exact date.

Senator TALIAFERRO. Do you know Mr. Wallace well?

Mr. MARKEL. Why, not intimately. I have known him and been acquainted with him for four or five years.

Senator TALIAFERRO. Are you quite certain that you met him in Chicago?

Mr. MARKEL. Yes, sir; absolutely.

Senator TALIAFERRO. You state positively that you met him there?

Mr. MARKEL. Yes, sir; I met him in his son's office in the Grand Central Depot building in Chicago in April last.

Senator TALIAFERRO. Let us see what Mr. Wallace says about it. You think Mr. Wallace is an honorable man?

Mr. MARKEL. Yes, sir.

Senator TALIAFERRO. A truthful man?

Mr. MARKEL. Yes, sir; and he would not make a misstatement for anything.

Senator TALIAFERRO. Senator Morgan asked this question of Mr. Wallace:

"And it was by reason of that that an invitation was extended to Mr. Markel to come down there?"

That refers to the preceding testimony, which I will not weary you to read.

"Mr. WALLACE. Yes.

"Senator MORGAN. Did you extend that invitation to him?

"Mr. WALLACE. I wrote Mr. Markel a letter, along in March, and just stated the general problem there. I do not know whether I invited him to come down or not, but I suggested to him the propriety of his coming down there and looking the situation over.

"Senator MORGAN. Have you a copy of that letter?

"Mr. WALLACE. I have; yes. It never reached him. It was miscarried.

"Senator MORGAN. He did not get it?

"Mr. WALLACE. He did not get it, but he got a subsequent one.

"Senator MORGAN. Of the same tenor?

"Mr. WALLACE. Of the same tenor; but he did not reach the Isthmus until after I had left there.

"Senator MORGAN. But did you have any personal interview with him about going to the Isthmus?

"Mr. WALLACE. None; except this, that after I had left the Isthmus and come up to New York he called on me in my hotel.

"Senator MORGAN. In New York?

"Mr. WALLACE. In New York. I was only slightly acquainted with him. I suppose I had met him possibly half a dozen times in my life. While he had charge of the commissaries on a branch line of 132 miles from Fort Dodge to Omaha, which I constructed for the Illinois Central Railroad, he was employed by and was under one of my subordinates that had charge of that part of the work, and I did not come in contact with him much. Afterwards I made another bargain with him to get up an organization to be able to feed a thousand men, our employees. I was apprehending a strike in our freight houses in Chicago, and I had arranged, in case I did not make a settlement with my men"—

Now, in view of Mr. Wallace's statement that he had no discussion with you on this subject except upon his return from the Isthmus, when he met you in his hotel in New York, do you adhere to your statement that you met him in Chicago?

Mr. MARKEL. Yes, sir; and if you will call Mr. Wallace's attention to that meeting and to his letter he will remember that he met me, not only in his son's office, but in the Union League Club, the next day, in Chicago. He has probably forgotten it.

Senator TALIAFERRO. Well, Mr. Markel, I have called your attention to that in order to give you the opportunity of making the correction. It is of no interest whatever to me.

Mr. MARKEL. Well, there is no correction absolutely to make of it, sir. I met Mr. Wallace accidentally. I was operating a boarding outfit for his son at Taylors Falls, Wisconsin. I am operating those kind of establishments pretty nearly all over the country. I was in his son's office in reference to this outfit, this boarding outfit, in Wisconsin, and while I was talking to his son I heard voices in the private office, and H. E. Wallace, his son, said, "Father is in there; come in and meet him."

I went into the private office, where Mr. Wallace was, and met him. I did not know him intimately. I had done a good deal of work for him; and as soon as I got in the room he wanted to know why I had not answered his letter, written in March, from the Isthmus. I told him I had not gotten any such letter, and in three minutes—I do not think he was over three or four minutes—he gave me an outline of what was in the letter, and he said, "Now, do you care to go down

there?" Then it was that I made an appointment with him and met him at the Union League Club for a few minutes the next day; and he left that afternoon for Washington. After I had consulted with my family and my son I wrote Mr. Wallace a letter at Washington, telling him that I had decided to go, and if he would arrange the transportation and make the other arrangements that I would go as soon as I could get my information together. He answered that letter by sending me a letter to his assistant in New York for the transportation and to secure my berths on the steamer, and at the same time he mailed me the letter that he had written on the Isthmus in March, which had been returned to his office here in Washington and re-mailed to me out there. Now, instead of mailing the old letter direct to me, his clerk made a mistake and sent it care of T. A. Moore, 120 Broadway, New York. That is the office of the Union Pacific Railroad. It was delayed there a day, and finally got to me, the next day after Mr. Wallace's second letter.

That is the history of that thing.

Now, I did not see Mr. Wallace again until the 23d day of June. I arrived in New York on the 22d, on my way to the Isthmus.

Senator TALIAFERRO. I have no special concern, Mr. Markel, with the discrepancy between your statement and Mr. Wallace's. That is for you gentlemen.

Mr. MARKEL. Well, I feel sure, Mr. Senator, that it is not a discrepancy on either my part or Mr. Wallace's. It is simply that he does not remember of the Chicago meeting.

Senator TALIAFERRO. Do you know Judge Magoon?

Mr. MARKEL. Yes, sir.

Senator TALIAFERRO. Did you know him before you went to the Isthmus?

Mr. MARKEL. Yes, sir.

Senator TALIAFERRO. Have you known him intimately?

Mr. MARKEL. Why, quite so.

Senator TALIAFERRO. Was he a schoolmate of yours?

Mr. MARKEL. No, sir. I knew Judge Magoon pretty well as a law clerk in Judge Mason's office in Lincoln. I have met him a number of times when he was a young fellow, and in about the year 1891 I was engaged in the hotel business in Lincoln and Governor Magoon was one of our guests, and he and my son were very fast friends, and in that way I knew him very well. Afterwards, in Missouri, he was my guest in my home, and I have been his guest.

Senator TALIAFERRO. Continuing this testimony, Senator Morgan propounded this question:

"After this conversation you had with Mr. Markel in New York, did you have any further conversation on the subject of his going to the Isthmus and establishing commissaries there?"

"Mr. WALLACE. At New York he asked me if I thought there was any use of his going down, now that I was leaving the canal. I told him that I did not see why he should not go down there. He told me that he and Judge Magoon had been schoolmates together and he was acquainted with the Judge, and I told him I did not see any reason why he should not go down there—at least, he would have a nice trip—and look the situation over, and then, in case he was called upon to do any of that kind of business, he would have the requisite knowledge."

Is that statement of Mr. Wallace's true or untrue?

Mr. MARKEL. I did not tell him that Governor Magoon and I were schoolmates. That could not be. I never went to school a day in my life.

Senator TALIAFERRO. Then, if he made that statement, it was untrue?

Mr. MARKEL. He was mistaken; he would not do it intentionally.

Senator TALIAFERRO. Well, the statement is true or untrue, Mr. Markel.

Mr. MARKEL. Well, it is untrue so far as I am concerned.

Senator TALIAFERRO. That is what I am trying to get you to say—whether it is true or untrue.

Mr. MARKEL. But I do not say that in the sense that Mr. Wallace would tell an untruth knowingly. That is what I mean.

Senator TALIAFERRO. You have made yourself quite clear at last.

Mr. MARKEL. Yes, sir.

Senator KITTREDGE. In speaking of the commissary, you had in mind the arrangements for the men on the silver roll?

Mr. MARKEL. Yes, sir.

Senator KITTREDGE. That is, the colored people?

Mr. MARKEL. Yes, sir.

Senator KITTREDGE. How long had that condition existed?

Mr. MARKEL. What condition do you have reference to, Senator?

Senator KITTREDGE. The one that you testified about in answer to my question a few moments ago—of cooking their food in kettles, and so on.

Mr. MARKEL. Why, when I was on the Isthmus the first time, just a few days before I left there, I went out on the road and picked out a number of buildings that had been left there by the French Canal Company, and they went at those buildings and repaired them up and made subcommissaries at different points all along the road and the canal, so as to furnish the silver-roll people as well the gold-roll people with a convenient commissary.

Now, the commissary had been operated by the railroad company for many years, and was then in operation for the gold roll, but not for the benefit of the silver roll; and that was why we were locating those commissaries. Now, after I left there they organized the silver-roll kitchens, as they called them, mess kitchens; and it was done to take care of the Jamaicans and Martiniques that came there "broke," that had no money, no way of living, unless they were taken care of. They had one of those kitchens at Culebra and one at Corozal, and one at Pedro Miguel, and one at La Boca.

Senator KITTREDGE. You are now speaking of conditions you found on your first trip to the Isthmus?

Mr. MARKEL. No; I was speaking of the conditions that I found on my second trip. The conditions that I found on my first trip ended when I said that I had located these different commissary stores. You understand that the commissary and the feeding of the silver-roll and the feeding of the gold-roll people were absolutely separated. The commissary had nothing to do with the hotel or the silver-roll question.

Senator KITTREDGE. Probably my question, including the term "commissary," was not understood by you. I meant the feeding of the colored men.

Mr. MARKEL. That was only done after I had left the Isthmus the first time. I found it in operation when I went there the second time.

Senator KITTREDGE. How long do you understand that condition you have described to have continued or been in force?

Mr. MARKEL. Why, I presume up to the present time. I do not know whether they are running those kitchens or not.

Senator KITTREDGE. And what was the condition of affairs in regard to the feeding of the help upon the gold roll who were there in October, 1905?

Mr. MARKEL. The employees that boarded at the hotels?

Senator KITTREDGE. Yes.

Mr. MARKEL. Why, as a hotel man, I thought they were crude.

Senator KITTREDGE. In what respect?

Mr. MARKEL. In so far as the cleanliness of the dishes and sanitation and the operation of the working part of the hotel was concerned.

Senator KITTREDGE. What was the character of the food?

Mr. MARKEL. While I was on the Isthmus it was fair. It was mostly canned goods.

Senator KITTREDGE. I mean at these hotels.

Mr. MARKEL. Mostly canned goods, though.

Senator KITTREDGE. Of what sort?

Mr. MARKEL. Well, of all descriptions—canned meats; they had some fresh meat, but it was local. You understand at that time they did not have a refrigerator plant in operation.

Senator KITTREDGE. How did the menus they were having in force at the time you were there in October compare with those that you had offered to furnish in your bid, and later, in your contract, agreed to do?

Mr. MARKEL. I did not think they were so good.

Senator KITTREDGE. In what respect?

Mr. MARKEL. Well, as to the quality of the food, and in respect to the cooking.

Senator KITTREDGE. Tell us about that feature of the situation.

Mr. MARKEL. Well, in my judgment, their cooks were not skilled cooks, such as I had intended to take there.

Senator KITTREDGE. What was their nationality?

Mr. MARKEL. I rather think they were Jamaicans; I do not know.

Senator KITTREDGE. Were any of them from the United States?

Mr. MARKEL. I did not see any.

Senator KITTREDGE. For how much less did you say that you would be willing to feed the help on the gold roll if permitted to give them the service that was then being furnished than that agreed to in your contract?

Mr. MARKEL. The price in the contract was \$36 a month, which included the care of the rooms. I told them on my second visit that if they would furnish me coal, freight free, and put me in the same position as they were then themselves, as far as the operation of the hotel was concerned, that I would change the contract to \$30 a month instead of \$36, and that it would be more profitable to me at that figure, with those expenses taken out, than it was before.

Senator KITTREDGE. Does the difference cover anything more than the freight rates and the free coal you have mentioned?

Mr. MARKEL. Yes, sir; it covered general office expenses, superintendence, and inspection expense.

Senator KITTREDGE. What about the feeding of the men? Would they receive the same food?

Mr. MARKEL. Yes, sir.

Senator KITTREDGE (continuing). Under your new contract as you agreed to furnish under your old contract?

Mr. MARKEL. Yes, sir. There was not anything in the old contract, Senator, other than a good, substantial meal.

Senator KITTREDGE. How did that meal compare with the meal that was being furnished the help? That is the point I want to have you explain.

Mr. MARKEL. It compared very much more favorably, for the reason that in my menu it was intended to use meats from the United States, which are very much better than the native meats. It was also intended to use a certain amount of good fish. Then, too, in the purchase of my supplies, dealing with a large number of people, I would have purchased the canned goods in gallons instead of small cans, for this reason—that there is about 20 to 25 per cent of economy in the purchase of your supplies in that way. For instance, a gallon can of tomatoes, what is called in trade a gallon can, that will cost 25 cents, will contain as much eatable tomato as six and a quarter of the small cans.

Senator KITTREDGE. Well, that refers to the condition of affairs from the standpoint of the contractor?

Mr. MARKEL. Yes, sir.

Senator KITTREDGE. I am trying to get at the conditions from the standpoint of the help. How do the meals that you found were in fact furnished under the administration of affairs when you reached the Isthmus in October compare with those that your contract required you to furnish?

Mr. MARKEL. I said they did not compare favorably, and you asked me—

Senator KITTREDGE. Explain in what way.

Mr. MARKEL. That was just what I was trying to explain—for the simple reason that I had made arrangements to purchase my goods in such ways that there would be economy in it; that I could furnish better goods for the same price that it cost them, or less.

Senator KITTREDGE. Are you speaking now of the fare for the men on the gold roll?

Mr. MARKEL. The gold-roll men.

Senator KITTREDGE. And the men on the silver roll were being cared for in the manner you have already stated?

Mr. MARKEL. Yes, sir.

Senator KITTREDGE. And how does that condition compare with the way that you were expected to and would have taken care of the men under the contract that you made?

Mr. MARKEL. I did not think that it compared very favorably, because in my contract I was to furnish them three substantial meals every day. That meal was to consist, one of them, breakfast—they use mostly bread and butter—

Senator KITTREDGE. Well, the contract shows what you agreed to do.

Mr. MARKEL. Yes; the contract shows that. Those meals were to be furnished thoroughly cooked; the premises were to be kept clean, the dishes sanitized, and meals served to them in the same way that we serve the ordinary laboring men or working men in this country.

Senator KITTREDGE. Did the Commission receive anything of value from the contracts that you had made with the supply people?

Mr. MARKEL. No, sir.

Senator KITTREDGE. The only thing that they received was such service as you may have rendered?

Mr. MARKEL. Yes, sir.

Senator KITTREDGE. And for that they paid \$5,000?

Mr. MARKEL. Yes, sir.

Senator KITTREDGE. My attention is called to a statement by Mr. Wallace, appearing on page 627 of the record, in answer to Senator Morgan's question, which is as follows:

"Without reference to board or anything of the kind?"

"Mr. WALLACE. Yes. The way I understood it from my conversation with him"—referring to you—"he looked on it as a nice interesting trip to go down there and see how that situation was, and that he mixed the business with it at the same time; and my idea in giving him free transportation was that I thought we would get enough out of his ideas to justify giving free transportation to him, and, I think, to two gentlemen that were with him—his assistants."

Have you any comment to make in reference to that statement of Mr. Wallace in reference to your trip to the Isthmus in June, 1905?

Mr. MARKEL. Well, I would hardly take my son and private secretary and go to the Isthmus or go anywhere else on a pleasure trip. I was not seeking a job. I had plenty of work of my own, plenty of business; but I had before that done work for Mr. Wallace, similar to that, and had been paid my expenses and a substantial advance over that.

Now, it was a question whether they could contract it or not. If I had gotten the contract I certainly would not have put a bill in for getting the contract; but, just the same, I think I was entitled to compensation for the time that I put in on the Isthmus, preparing to go to the Isthmus, and for submitting plans and specifications, putting in an organization down there that they have used since the latter part of July and are using to-day for constructing. They are putting up now the permanent refrigerator plant that was brought about by the information that I got before I went to the Isthmus, and by the information that I furnished the experts, Mr. Smith and Mr. Gardner, as to what, from a hotel man's standpoint, would be necessary. After they had gotten into the work of putting up the refrigerator Mr. Shonts decided that there would be a certain amount of commercial business there for a refrigerator, and it was enlarged so as to take care of any commercial business that might come to it.

The blueprints and specifications of the laundry building and the machinery I turned over to the chief engineer of the Panama Railroad; also for the bakery, and other information that cost me time and money to get.

Senator TALLIAFERRO. Now, Mr. Markel, if you felt that you were entitled to compensation for those things, why did you not include

it in your bill against the railway company? If you felt that you were entitled to ten thousand seven hundred and forty-odd dollars, or \$10,715, whichever the case may have been, why did you render to the railway company a bill for only five thousand seven hundred and some dollars?

Mr. MARKEL. That was the actual cash expended.

Senator TALIAFERRO. But, Mr. Markel, if you felt you were entitled to more, why did you not put it in a bill against the company? .

Mr. MARKEL. I did not put in any bill for that; I put in a bill for my expenses.

Senator TALIAFERRO. Why did you not put in a bill?

Mr. MARKEL. I said to them: "I will leave it to you what you pay me for my service."

Senator TALIAFERRO. Why did you not put in a bill?

Mr. MARKEL. Because if I had put in a bill for what I thought I ought to have had I would have made it \$25,000 instead of \$10,000 or \$11,000.

Senator TALIAFERRO. On what theory? You said a moment ago that you thought you ought to have had \$6,000.

Mr. MARKEL. On the theory of forty years of experience that I gave to that work. I have spent fifty years of my life in trying to find out what I told this railroad company and the Commission as to what to do. That is my stock in trade. That is my capital. And if you or any other man, or the Government, or the community, would come to me to-day and ask me to do what I did last summer I would not undertake it for less than \$25,000. I do not always make \$25,000 a year, but I consider myself worth that, and more, too; and I consider my service rendered to the railroad company and to this Government well worth \$25,000 instead of the \$10,750 that I got.

Now, that is my honest opinion about it. But I had said to Mr. Shonts at the beginning of this thing—he had been so entirely fair—I was in a position to enforce my contract against the Government if I had had a mind to; but that is not the way I was brought up out West. I did not want to embarrass Mr. Shonts nor the railroad officials nor the Government. I knew I had a valuable contract there, and I knew that I could enforce it if I wanted to go into court and make trouble; but I am not built that way. And for that reason I said to Mr. Shonts: "Now, I will do what you say is right. Whatever you say goes." That is the reason why I gave them the privilege to cancel that contract, waiving my thirty-day right. It was not that I thought I did not have a profitable contract. I know I had a good contract.

Senator TALIAFERRO. With the thirty-day provision in it?

Mr. MARKEL. Yes, sir; for the simple reason that at the end of the first thirty days—they could not cancel it under thirty days—at the end of the thirty days I would have had profit enough to make me whole on the money that I had expended in getting my organization going.

Senator KITTREDGE. And the \$5,000 besides?

Mr. MARKEL. No, sir; not the \$5,000 besides.

Senator TALIAFERRO. Well, that can all be verified. That is all shown in the records. You have rendered an account of what it would have cost you to feed those men?

Mr. MARKEL. Yes, sir.

Senator TALIAFERRO. It is all here. That will show what profit there was in it?

Mr. MARKEL. Yes, sir. Would you like to know what I expected out of that?

Senator TALIAFERRO. No.

Mr. MARKEL. All right.

Senator TALIAFERRO. No; I would like to know why, with your extravagant expectations and the value you put upon your services, you made no contention whatever for the payment of any amount to you by this Government when you say that you gave them practically six months of your time. That is all I would like to know.

Mr. MARKEL. From my confidence in Mr. Shonts that he would do what was right.

Senator TALIAFERRO. Do you think he did what was right?

Mr. MARKEL. What he did was right with me.

Senator TALIAFERRO. You think—

Mr. MARKEL. I think that.

Senator TALIAFERRO. You think, then, that the service which you say you reckon as worth \$25,000 was correctly paid for in the sum of \$5,000 that was given you by the Board?

Mr. MARKEL. I expected that they would give me \$6,000, \$1,000 a month. That is what I expected. That is what I told Mr. Shonts that he ought to give me when he asked me about it afterwards, just before the meeting of the Board, after I had put in my bill for expenses. That was the only discussion we ever had, and it was not two minutes long; it was not two seconds, hardly. But I made no demand for my service, because there were a great many circumstances connected with it. I felt as though if I undertook to enforce that contract it might embarrass a whole lot of people—that is, it might embarrass the Government.

Senator TALIAFERRO. Who else?

Mr. MARKEL. Well, anybody that was interested in digging that canal. I could have enforced it, or tied it up. I know my rights; but I did not care to assert them, nor would I do it. There was not any consideration I would have done it for.

Senator TALIAFERRO. From patriotic considerations you waived your rights?

Mr. MARKEL. Yes, sir; I certainly did.

Senator ANKENY. In your evidence, Mr. Markel, you said that you had to pay the Panaman Government for the concession to sell tobacco and other matters on the Isthmus?

Mr. MARKEL. No; the firm of Brandon Brothers.

Senator ANKENY. By what right did they collect money from you for this concession?

Mr. MARKEL. Because they had purchased the right from the Panaman Government.

Senator ANKENY. On our zone and all?

Mr. MARKEL. As I understood it; yes, sir.

Senator ANKENY. Let me get that clearly. The Panaman Government sold to Brandon Brothers the right to collect that money from Americans selling in our zone? Is that what you say?

Mr. MARKEL. Yes, sir; as I understand, Senator, down there all those things are farmed out. For instance, there is one firm there that has the butcher privilege.

Senator ANKENY. What I am inquiring about is the matter of the privilege as far as the Government is concerned. I am not aware that they have an understanding with us that they can do that. What I am getting at is, Can the Panaman Government collect concessions in our territory?

The CHAIRMAN. I do not know whether they can or not, but they do.

Senator ANKENY. There is no disposition to be captious or critical about this, you understand, Mr. Markel.

Mr. MARKEL. Oh, no; I understand that thoroughly.

Senator ANKENY. It simply occurred to me, and I wanted to see how that could be.

Mr. MARKEL. Well, it was a conundrum to me, Senator, but that was the fact. I looked up this beef business a good deal, and I ascertained that after you purchased these cattle at \$55 a head, silver, you would have to pay Brandon Brothers \$10 a head for the privilege of killing them, and that made \$65 a head.

Senator ANKENY. On the Zone?

Mr. MARKEL. On the Zone, or in Panama.

Senator ANKENY. You have mentioned tobacco and its products—cigarettes and cigars, and such things. Does that extend to commissaries, as we call them—to goods of any kind but beef and tobacco?

Mr. MARKEL. Why, I understand that they divide up the privileges. They have the privilege of the tobacco and the cigars and the cigarettes and the beer and the whisky. That is a separate concession.

Senator ANKENY. Of this concern?

Mr. MARKEL. Yes, sir. Then everything else is put into "miscellaneous," and they pay a certain sum.

Senator ANKENY. But for everything—

Mr. MARKEL. For everything they pay the Government a certain sum, and they collect the duties. The Government does not collect the duties down there, as I understand it.

Senator ANKENY. But this concern must have a shadow of authority.

Mr. MARKEL. They have it from the Government?

Senator ANKENY. The Panaman Government?

Mr. MARKEL. Instead of paying the Panaman Government you pay Brandon Brothers, if you go to them and buy your goods, the price of the goods, and the duty is tacked on. Now, if you import the goods—say, for instance, you buy a thousand cigars in Jamaica and pay \$50 for them and send them to Colon, we will say, you get the cigars and pay Brandon \$20 and pay the man in Jamaica \$50. Now, you can go and buy that same cigar from Brandon at \$70.

Senator ANKENY. Is not this news to you? Were you aware of this, Mr. Chairman?

The CHAIRMAN. I heard of it when I was on the Isthmus. Yes; I heard of it when I was there.

Senator ANKENY. That is all I wish to ask. I was rather surprised that such a condition existed in our territory, that is all.

Mr. MARKEL. Now, whether that extends entirely over the Zone or not I do not know, but, as I understand it, these little towns along the railroad, while they may be in the 5-mile limit, are not Zone towns; they are Panaman municipalities.

Senator ANKENY. On our territory?

Mr. MARKEL. On your territory, I think.

Senator ANKENY. I did not know how that was. However, those are the facts. We will find the law, if there is one.

(The committee thereupon adjourned until to-morrow, Saturday, March 3, 1906, at 10.30 o'clock a. m.)

(The following are the papers referred to by Senator Taliaferro during his examination of Mr. Markel, which, by direction of the committee, are printed as a part of the record:)

[NOTE.—The words printed in italics in the following paper appear in pencil in the original.]

1. Jacob E. Markel.

2. Omaha, Nebraska. My legal residence is Nebraska, my temporary residence is Chicago.

3. My business has been the construction and operation of hotels, eating house, lunch counters, boarding camps and boarding trains in Omaha and Lincoln, Nebraska, and along the line of the Union Pacific railroad, the Denver and Rio Grande, Kansas City and Southern, Chicago, Burlington and Quincy, Denver, Northwestern and Pacific, and other railroads.

4. I visited the Isthmus, leaving Omaha June 19, 1905, arriving at New York June 22, leaving New York June 26, arriving at Panama July 7, and I remained there until the forepart of August. I went to the Isthmus because of an interview with Mr. John F. Wallace, who I happened to meet in his son's office in Chicago the latter part of April. He at that time called my attention to a letter he had written to me from the Isthmus the forepart of March, *this* letter did not reach me until about 18 May—Mr. Wallace forwarding it to me from Washington on his arrival there from Chicago.

5. Before going to the Isthmus I gathered together information, blue-prints and specifications relating to refrigerator plant, laundry, bakery, furniture and fixtures of all kinds necessary, *calling to my aid Mr. Smith Armon & Co.* in my judgment, to be had for the care of the employees on the Isthmus; and while on the Isthmus, besides going over the ground thoroughly as to the arrangements and location of the hotels and camps, I made a trip over the road and canal accompanied by the chief architect, the superintendent of construction of buildings, an officer from the Governor's office who was familiar with the location of the buildings left by the French canal people, and located a number of branch commissary stores along the line of the railroad and canal—the architect and building inspector taking measurements, making plans and ordering material for repairs; all of which was embodied in my report to Chief Engineer Stevens under date of July 29th. These branch commissary stores having no connection in any manner with the feeding and care of the gold or silver employees, as the commissary was intended to be operated entirely separate and distinct from the hotels and camps.

6. Yes. I had a conversation with Mr. Shonts, Governor Magoon, and especially with Mr. Stevens in regard to what portion of their salary employees of that kind would pay for their board and what they would likely spend were they given commissary privileges. In

reply to the question asked by Mr. Stevens, I advised him that my experience was they would cheerfully pay from 33 to 40% of their salary for lodging and board, and that my experience had been where I operated a commissary instead of a boarding car for the negroes in the south, they would spend about fifty per cent. of their earnings. Mr. Jackson Smith, who was present at this conversation, agreed with this opinion.

7. From July 6, 1905, to August 2, 1905.

8. With my son I accompanied Governor Magoon from Panama to Colon July 26th to meet President Shonts, Chief Engineer Stevens, and other officials of the railroad and the commission on their arrival at Colon that day: was introduced to them by the Governor and had conversations with these officials during the day and evening at the *gov. House* and accompanied them on an inspection tour the next day July 27 over the railroad and canal, and had numerous conversations with them up to the time I left the Isthmus.

9. Yes. With Governor Magoon, with whom I have had an acquaintance of long standing, having been personally acquainted with him while he was a guest of a hotel in Lincoln, Nebraska, of which I was part owner, and in the operation of which I was assisted by my son. And he was also *frequently* a personal guest of my son and myself at our home in Omaha, Nebraska. And a business acquaintance with Mr. Stevens, as I operated a large boarding camp at Moline, Illinois, while he was with the Rock Island Railroad.

10. Yes, sir.

11. Yes, sir.

12. No, sir. Absolutely none, as when I was arranging to go to the Isthmus I communicated with no one other than Mr. Wallace, Governor Magoon, my own family and the different firms from whom I was seeking information.

13. Leroy B. Wadleigh, my father-in-law, now a resident of Pierre, S. D., formerly a lumber merchant and banker of Clinton, Iowa. Mr. Wadleigh and I had arranged to put in \$100,000. cash and had arranged with different firms for credit of from fifty to a hundred thousand dollars, as our needs might be—our idea being that it would take from \$150,000. to \$200,000. in money and credit to properly operate the business.

14. September 7th, 1905, in the office of the president of the Panama Railroad Company, 24 State street, New York; and it was formally, both verbally and in writing, canceled at Panama October 9th.

15. Not being present at the meeting of Mr. Shonts, Mr. Stevens, Governor Magoon and Jackson Smith, when it was decided to cancel the contract, I am unable to say positively why it was cancelled; but am of the opinion that it was done because of Mr. Stevens' opposition to the enforcement of the contract based upon misrepresentations made by Mr. Jackson Smith to him as to the cost of the keep of the employees.

16. Yes, sir.

17. Yes, sir; both written and oral.

18. Because of disquieting cablegrams received in New York September 22nd by Mr. Shonts from Mr. John F. Stevens protesting against the contract, claiming that it would cause the salaries of all employees to be advanced and stating that it was a well-known fact

on the Isthmus that if the Markel contract was carried out there would be a net profit of one million dollars per year to the contractor.

19. The amount of my loss or gain, should that have happened, would have been based entirely upon the amount of money that I had expended in paying the salaries of employees, for transportation, living, etc., as it was agreed in the contract that should it be terminated by the railroad company, that they should purchase from us all goods, material, etc., on hand either in the store-room, at Colon, at the hotels or camps or in transit, and that they would assume any food contracts that we might have in force.

20. Yes, I think so, for the reason that I had carefully gone over the ground, figuring up costs of food-stuffs, transportation and everything that goes to make up a hotel or camp, and with forty years of experience at the back of me I feel sure that I had a profitable contract, as in my opinion the present management do not understand their business; and for the further reason that I had made all arrangements for supplies in yearly contracts on the principal food-stuffs that we would have used on the Isthmus, at prices that insured me stability for a year at least; and had arranged to handle my canned-goods and other articles of that kind in an economical and intelligent way, having with me men of large experience, not only in this country but in the tropics: However, I would not care to renew it if the present management were to be in a position that would in any way interfere with my operations or where I would be subject to their orders or commands.

21. Well, commencing at the beginning, when in Chicago latter part of April I accidentally met Mr. Wallace and he asked why I had not answered his letter from the Isthmus I advised him that had received no letter and he explained to me as well as he could remember its contents, and an outline of what he would like to do.

He wanted to know if I would care to go to the Isthmus, make an investigation and see if some kind of a deal could not be made whereby the employees could be well taken care of; and I advised him that I would consult my son and family and let him know whether I would go or not—which I did and received an acknowledgement of my letter in a few days (copy of which will be found in *Senate Document 127, page 389*), and at the same time I received the letter written to me by Mr. Wallace on the Isthmus March 4, it having been returned to him through the dead-letter office.

I immediately began my preparations by getting together such information relating to refrigerator, laundry, bakery and other equipment in my judgment necessary to be had. *Consulting with Smith of A & co*

Having completed this work, I left Omaha on June 19th and arrived at New York June 22nd, having engaged berths on the steamer leaving the 24th.

En-route to New York I noticed in the papers that Mr. Wallace had left the Isthmus and that it was rumored he had resigned. Upon arrival in New York I ascertained that Mr. Wallace was at the Hotel Marie Antoinette. I had an interview with him June 23rd (Friday morning) when I asked him if the reports were true and if I should continue my trip to the Isthmus. He asked if I was afraid of yellow fever, and on my assuring him I was not it was decided that I should go on, he remarking "you are acquainted with Gover-

nor Magoon; take the matter up with him *bring letter on your Return* to Mr. Shonts: you need not bring a letter to me as I know all about it." At that time he gave me a letter of introduction to Mr. Douchev, *Page 392 Doc 127* and several officials connected with the railroad and the canal.

Our boat was delayed and I did not leave until June 26th—arriving at Colon July 6th. On arrival I proceeded at once to Panama, and after a visit with Governor Magoon presented my letter of introduction to Mr. Douchev and arranged with him to make a trip over the railroad and canal with him and other officials the next day—leaving Panama at 7 o'clock July 7th, meeting with Captain King and other officials and joining Mr. Douchev at Empire. He and other officials, accompanied by me, made a complete inspection trip that day. *found 2 Hotels operated. both are bad. wash machine dirty dishes—*

I devoted my time to getting the geography of the country in my mind as to the location of hotels and camps as they related to or were in proximity to the railway and canal side-tracks, returning to Panama that evening.

I made trips either by train, on horseback or on foot every day from that time up to my leaving on August 1st, investigating, inspecting and making my plans.

Having investigated the matter as far as I thought necessary, on July 20th I made a written report to Governor Magoon; *this report you will find in Senate Document 127 at page 394*, setting out my ideas of what was necessary to be done in order; suggesting a store-room, refrigerator, laundry, bakery and other plants located at Colon, with a supply train to leave there each morning stopping at each camp and hotel for the delivery of fresh supplies; suggesting where and how this was to be done, and advising that it would be necessary for the government to furnish the plants; and adding that should they decide to let the contract to private parties I would be a bidder, but that if they should decide to operate it themselves, such information and papers as I had were at their service. In my interview with him, when submitting my letter, he advised that the subject was of so great importance that it would be necessary that Chairman Shonts be consulted, and Governor Magoon said that he would cable to the States and ascertain whether Mr. Shonts would reach the Isthmus soon, and if not he would give me a letter and I could take the matter up with Mr. Shonts in the States. A copy of the cablegram I hand you. *also see page 393, Doc 127*

Soon after, Governor Magoon advised me that Mr. Shonts, Mr. Stevens, and other officials had left New York and were on their way to the Isthmus, and I awaited their arrival there. My son and I accompanied Governor Magoon and met the officials on July 26th, returning to Panama on the 26th. *Continuing my investigation per cattle-market price &c* As the food proposition seemed to be of great importance the matter was taken up en-route to Panama. In the evening, at the Governor's house, Governor Magoon having turned over my letter, addressed to him, to Mr. Shonts, the subject was discussed. Mr. Shonts was clearly of the opinion that if the government furnished the plant that it would be best that they operate the same. Mr. Stevens and Governor Magoon did not agree to that, claiming, and justly so, that their time was so taken up that they could not give it the attention it required. It was decided that even-

ing to make an inspection trip over the railroad and canal the next day, July 27th, and I was requested to accompany them, which I did.

On this trip it was decided that something must be done, and at once, in reference especially to the silver-roll employees. I suggested to them that if they would give me the necessary assistance that I and my son would go over the road the next day and make some suggestions as to increasing the facilities of the commissary then in operation at Colon by extending it along the line at different points.

I left Panama the next day, July 28th, accompanied by the chief architect, and other officials, and selected a number of buildings and sites for buildings, which I embodied in a report to Chief Engineer Stevens the next day (29th) which was adopted and put into force and is now being used. A copy of this report can be found in Senate Document 127, page 396.

As my work had been accomplished, I left the Isthmus on August 1st, with the understanding with Chairman Shonts and all the other officials that after they had more fully investigated the matter and decided what they could do, they would communicate with me further if they desired my service or any information which I had.

On my arrival in New York August 8th I received a cablegram from Mr. Shonts advising me that he would arrive in New York August 14th and would consult with me in reference to the proposition. As the time was too short to go home and return to New York in time to meet Mr. Shonts I awaited his arrival there and met him on the dock on the morning of his arrival, August 14th, and arranged to meet him in Washington August 24th, which I did, accompanied by Mr. Smith, chief engineer and refrigerator expert of Armour and Company. Mr. Shonts being ill at home, we went to New York and met him at the Waldorf Hotel August 26th. After discussing refrigerator and other propositions, Mr. Shonts advised that he had procured the services of Mr. Gardner, chief engineer of Swift and Company, who would arrive in New York on Monday, August 28th, which he did.

After going over certain plans, Mr. Smith, Mr. Gardner, Mr. Allwork, chief engineer of the Panama Railway Co., and myself went to Washington on the 29th, and spent the time up to and including September 2 in formulating plans and specifications in detail for the refrigerator and other plants, and arrived at the cost of the plants and of operation, etc., and submitted them to Mr. Shonts. That ended my service as an expert and adviser.

From those plans I presume Mr. Shonts formulated his plans and specifications to receive bids for the concession, which was awarded me in New York September 7th.

I received a copy of the proposed contract and was ready in New York September 4th to place my bid, when I was advised of its being a holiday and that Mr. Shonts had 'phoned that on account of its being a holiday the next day would suffice. The next day, September 5th, I went to Mr. Shonts office abt noon and was advised that because of the fact that Balfe and Company had requested another day that Mr. Shonts had postponed the letting of the contract until the following day, the sixth. Upon going to the office the next day (the 6th) I was advised that a letter had been written me and sent to the Waldorf, where I was stopping, advising that because of the great discrepancy in the bid, Mr. Shonts had thought best to write the bidders in reference to some clauses in the contract. This letter was re-

ceived by me and I answered same at once. The next day, the 7th, the contract was awarded to me.

Immediately upon the signing of the contract I began my arrangements to go to the Isthmus as quickly as possible, as Mr. Shonts advised me that the situation was critical and that the two hotels which were then constructed were in bad shape, and he wanted me to leave on the next steamer (which was but two days off) with the crew and take over those two hotels. This I could not do because of my forces at that time being scattered; but I got them together and arranged to leave on the next steamer, which was September 23rd—I leaving for the west immediately to make my own personal arrangements. On arriving in Chicago September 9th, I received a cablegram from Mr. Stevens suggesting a change in the gold-roll bill of fare, whereby a cheaper meal could be served, and his request was complied with. I made my arrangements and left Omaha September 19th to assume the duties of my contract, arriving in New York September 22nd with my employees, to have them sail on the steamer Finance September 23rd, to assume charge of the two hotels that were then constructed.

On my going to Mr. Shonts office after my arrival I was advised of the disquieting cablegrams from the Isthmus and after a discussion of this matter it was decided that I should go to the Isthmus with Mr. Shonts, leaving September 28th—and it was at that time that I gave Mr. Shonts the authority to cancel the contract at any time that suited his convenience: or, in other words, waived the 30-day clause in the contract.

On our arrival I immediately arranged to leave my employees in New York, taking with me one or two of my assistants, but arranged to send the gentleman I had employed as purchasing agent to the Isthmus on the steamer Finance sailing the 23rd.

On arrival at the Isthmus numerous conferences were had and the contract was cancelled.

On my return to New York I dispersed my employees and made my arrangements, and had a final settlement with the directors of the Panama Railroad Company in New York on November 8th.

Exhibit of earnings and expenses covering 5-year period.

	Earnings.	Expenses.	Profits.	Profits.
First year:				
Gold roll, 2 Hotels	129,000.00	124,068.00	4,932.00	
Silver roll, 1000 men	144,000.00	134,244.00	9,756.00	
				14,688.00
Second year:				
Gold roll, 4 Hotels	259,200.00	223,701.12	35,498.88	
Silver roll, 2000 men	288,000.00	268,488.00	19,512.00	
				55,010.88
Third year:				
Gold roll, 6 Hotels	388,800.00	319,766.40	69,033.60	
Silver roll, 5000 men	720,000.00	671,220.00	48,780.00	
				117,813.60
Fourth year:				
Gold roll, 6 Hotels	388,800.00	319,766.40	69,033.60	
Silver roll, 5000 men	720,000.00	671,220.00	48,780.00	
				117,813.60
Fifth year:				
Gold roll, 6 Hotels	388,800.00	319,766.40	69,033.60	
Silver roll, 5000 men	720,000.00	671,220.00	48,780.00	
				117,813.60
	4,147,200.00	3,724,060.32	423,139.68	423,139.68

This exhibit contemplates operating the following numbers of hotels & camps:

1st year	{ 2 Hotels	300 Gold Roll Men.
	{ 5 Camps	1000 Silver Roll Men.
2nd year	{ 4 Hotels	600 Gold Roll Men.
	{ 10 Camps	2000 Silver Roll Men.
3rd, 4th, & 5th year	{ 6 Hotels	900 Gold Roll Men.
	{ 25 Camps	5000 Silver Roll Men.

There has not been added to the foregoing exhibit of cost anything for expenses of contractor & partners or for maintenance of New York office; nor has there been any allowance for loss in handling of foods in a tropical climate.

Exhibit of cost of operation for 6 hotels.

(Gold roll.)

MEALS.

[Words in italic were in pencil in original.]

Provisions	\$.11003
Labor .....	.07400
No—General Office at Colon & Executive Expense .....	.03518
Coal .....	.00333
Ice .....	.00411
Light .....	.00600
No—Ice for Refrigerator Cars .....	.00515
No—Storage & Office Rent—Colon .....	.00311
Freight or rent of Cars—Colon to destination .....	.00133
No—Expense of Employees—New York to Colon .....	.00345
No—Expense of Employees—Colon to destination .....	.00022
Traveling Expenses of Inspector .....	.00111
Laundry .....	.01029
No—Insurance .....	.00030
Repairs & Replacements .....	.00939
Cost per Meal, each Man .....	.26700
“ “ Day, “ “ .....	.80100
“ “ Month, “ “	24.09000

Exhibit of cost of operation for 2 hotels.

(Gold roll.)

MEALS.

Provisions	\$.11003
Labor .....	.07400
General Office at Colon & Executive Expense .....	.07560
Coal .....	.00333
Ice .....	.00411
Light .....	.00600
Ice for Refrigerator Cars .....	.01555
Storage & Office Rent—Colon .....	.00932
Freight or Rent of Cars—Colon to destination .....	.00133
Expense of Employees—New York to Colon .....	.00345
Expense of Employees—Colon to destination .....	.00022
Traveling Expenses of Inspector .....	.00165
Laundry .....	.01029
Insurance .....	.00030
Repairs & Replacements .....	.00763
Cost per Meal, each Man .....	.32281
“ “ Day, “ “ .....	.96843
“ “ Month, “ “	29.05290

Exhibit of cost of operation for four hotels.

(Gold roll.)

MEALS.

Provisions	\$0.11003
Labor .....	.07400
General office at Colon and executive expense .....	.04722
Coal .....	.00333
Ice .....	.00411
Light .....	.00600
Ice for refrigerator cars .....	.00777
Storage and office rent—Colon .....	.00466
Freight or rent of cars—Colon to destination .....	.00133
Expense of employees—New York to Colon .....	.00345
Expense of employees—Colon to destination .....	.00022
Traveling expense of inspector .....	.00165
Laundry .....	.01029
Insurance .....	.00030
Repairs and replacements .....	.00888
Cost per meal, each man .....	.28324
Cost per day, each man .....	.84972
Cost per month, each man	25.49160

Cost per meal—Government ration—Basis 100 men.

Lbs.	Item	Oz.	Price	Amount
125	Fresh Meat	20	13	\$16.25
112½	Bread	16	5	5.02
100	Potatoes	16	1½	1.25
15	Beans	2½	4	.60
10	Prunes	1½	5	.50
12½	Coffee	2	20	2.50
20	Sugar	3½	6½	1.35
2	Qts. Vinegar		10	.20
¾	Salt	1	1	.04
½	Pepper	1	16	.04
¾	Soap	1	5	.16
Total cost of provisions for 100 men				28.51
<i>Additional:</i>				
	Butter Per day		\$1.50	
	Eggs " "		2.00	
	Tomatoes "		1.00	
				4.50
Total cost for 100 men, 3 meals per day				33.01

Cost per meal, \$0.11003.

Cost to maintain one hotel—Estimating 150 men.

Manager & Wife	\$150.00
" Board, \$10.00 each	20.00
Head cook	150.00
" Board	10.00
Second cook (a)	100.00
" Board	10.00
Third Cook	60.00
" Board	10.00
Storekeeper	100.00
" Board	10.00
Head Waiter	75.00
" Board	10.00
9 Waiters, @ \$20.00 a month each	180.00
" Board, @ \$10.00 a month each	90.00
Yard Man	25.00
Total	1,000.00
Labor on 13,500 meals, \$1,000.00, or .074 per meal.	

General roll for 1st year.

Chief Clerk	\$250.00	
Inspector	300.00	
Purchasing Agent	400.00	
General Storekeeper	200.00	
Stenographer	150.00	
Three Clerks	375.00	
Supply Car Messenger	100.00	
Laborers, Truckers & Helpers	275.00	
	<hr/>	
	\$2050.00	\$2050.00
Second year add:		
Inspector	\$200.00	
Relief Manager	150.00	
Relief Cook	150.00	
	<hr/>	
	\$500.00	500.00
Third year add:		
Relief Manager	\$150.00	
Relief Cook	150.00	
	<hr/>	
	\$300.00	300.00
	<hr/>	
		\$2850.00
Coal—500 lbs. each hotel, @ \$6.00 per ton		
Ice—1000 lbs., @ \$3.70 per ton, Colon		
Light—60 lights, 3 hours per light, 1-1/2c per hour		
Ice—Refrigerator Car, 4 T. per day, 120 T. per month, @ \$3.50, \$420.00		
Storage & Rent of Office, Colon, \$250.00 per month		
Freight, Colon to Hotels, 4 lbs. per man, 150 men, 600 lbs., @ 10c, 60c per day		
Expense of employees, New York to Colon, 14 people per year, round trip \$40.00,		
\$560.00		
Same—Colon to destination, @ \$2.40 per man per year		
Inspector's daily expense, \$1.50.		

Laundry.

3 napkins per man, 150 men, 450 per day
Side Towels, 27 per day
Kitchen Towels, 20 per day
Table Cloths, 36 per day
Dollies, 20 per day
Cooks' Jackets, 6 per day
Waiters' Jackets, 18 per day
Aprons, 36 per day
Insurance, \$4.00 per month
Repairs & Replacements:
1st Year — \$100.00 per month each hotel
2nd Year — 150.00 " " " "
3rd
4th } Years— 200.00 " " " "
5th }

Exhibit of cost of maintenance of rooms.

<i>Lights</i>	Per hotel per month
150—3 hours per day, @ 1½¢ per hour	\$202.50
<i>Laundry</i>	
Sheets—150 per day, 4500, @ ½¢	\$22.50
Pillows—75 per day, 2250, ½¢	11.25
Hand Towels—300 per day, 9000, @ ½¢	45.00
Bath Towels—150 per day, 4500, @ ½¢	22.50
	<hr/>
	101.25

<i>Soap</i>		
1 cake weekly, 4 per month, 600, @ 3¢	.....	\$18.00
<i>Ice</i>		
200 per day, 6000, @ \$4.00	.....	12.00
<i>Attendants</i>		
1 man for 15 rooms and porches, 10 men per day, @ \$1.00 per day	...	300.00
1 bar scrubbing soap, rooms and porches, per man, 10, @ 4¢ each, 40¢ per day	.....	12.00
Brooms, mops, pails, scrub brushes	.....	6.00
2 bell boys @ \$30.00 per month	.....	60.00
Clerk, or cashier	.....	125.00
		<hr/>
		\$836.75
\$5.578—per man—per month.		

Exhibit of cost of operating silver roll camps.

Cost, per meal, per man	.....	\$ .12430
“ “ day, “ “	.....	.37290
“ “ month, “ “	.....	11.18700
Net profit per month, per man	.....	.81300

This estimate based on using the following employes for each five camps, or 1,000 men.

1 Inspector—salary	.....	\$200.00
expense	.....	45.00
1 relief cook—salary	.....	100.00
expense	.....	30.00
1 relief commissary—salary	.....	100.00
expense	.....	30.00
		<hr/>
		\$505.00

ISTHMIAN CANAL AFFAIRS,
OFFICE OF ADMINISTRATION, PANAMA CANAL BUILDING,
Washington, D. C., March 2, 1906.

SIR: I beg to acknowledge the receipt by messenger of your letter of to-day, in which you say that Senator Taliaferro advises you that there are affidavits on file in this office and in the War Department, made by bidders for the contract awarded to Mr. J. E. Markel, relating to the form of said contract; and in which you request that copies of said affidavits be furnished you by 2 p. m. to-day.

There were but three bids received in response to the invitation of the Panama Railroad Company for proposals for conducting the feeding arrangements for employees on the Isthmus, as follows: Hudgins & Dumas, H. Balfe & Co., J. E. Markel.

The records do not show that Messrs. Balfe & Co. submitted any affidavits in connection with this matter, nor is there any recollection on the part of anyone connected with the matter that such an affidavit was ever submitted or mentioned.

Messrs. Hudgins & Dumas, in a letter to the Secretary of War dated October 16, 1905, through their counsel, Edward Van Ingen, submitted papers regarding the feeding privilege on the Isthmus, and among them is the protest of Hudgins & Dumas, in the form of an affidavit, to the award of J. E. Markel of the food contract. I inclose you herewith the original of this protest, and, as time will not permit the placing of a copy of same in your hands by the hour

desired, it is respectfully requested that this original protest be preserved and returned to the files of the Commission.

There are no papers on file in the War Department relating to this matter.

Very respectfully,

T. P. SHONTS, *Chairman.*

Hon. J. H. MILLARD,

*United States Senator, Washington, D. C.,
Chairman Committee on Interoceanic Canals.*

In the matter of the award of the privilege of feeding and lodging employees on the Isthmus of Panama.

STATE OF NEW YORK,

County of New York, ss:

We, Houlder Hudgins and Charles J. Dumas, being duly sworn, depose and say:

We are engaged in business in the city of New York as commissary contractors, and have been for the three years immediately prior to the 1st day of July, 1905, the holders of the Government privilege of feeding immigrants at the Ellis Island immigrant station, New York.

Believing that a privilege would at some time be granted to supply the employees at the Isthmus of Panama with food and lodging, we have entertained this subject for upward of a year last past. Since July 1, 1905, we have devoted practically our entire attention to this matter, and on August 4 sent to Chairman Theodore P. Shonts, of the Canal Commission, a telegram (Exhibit A) expressing our desire to bid for the privilege which we understood was to be granted. Following our telegram we wrote Mr. Shonts on August 23, 1905, a letter (Exhibit B) saying "all we need is to know what the requirements are, and we assure you that we can be depended upon to meet promptly and satisfactorily any reasonable commissary situation." On August 30 we again wrote Mr. Shonts a letter (Exhibit C) volunteering information, which we deemed of assistance to him in preparing specifications, and offering to submit to him sample menus covering an entire week.

To this last letter we received a reply from Mr. Shonts, dated September 1, 1905 (Exhibit D), setting forth in a general way the nature of the plant which the Commission intended to supply and a few comments as to what the final plans would contain. On Saturday, September 2, at about noon, at the close of the week-end business day preceding a double holiday (Sunday and Labor Day), we received from Washington a letter from Mr. D. W. Ross, the general purchasing agent of the Commission, dated September 1, 1905 (Exhibit E), inclosing a draft of a contract for the work in question and requesting from us a proposition on the terms outlined in the draft, to be delivered to Mr. Shonts at his office in New York City at 12 o'clock noon of the following Monday, September 4 (Labor Day). This draft of contract was the only paper ever submitted to us containing any specifications and called for proposals to be sub-

mitted within two days, both of which were holidays. We hastily prepared our bid, however, and in order to expedite the matter incorporated in it the "sample menus," as requested by Mr. Shonts, and were prepared to submit the same to him at the time called for, viz, at noon on Labor Day, September 4. Mr. Shonts, however, did not appear at his office until the following day—September 5—on which day at noon, the time which we were informed he would receive the bids, we submitted to him in person our proposal, to which were attached the original copies of the "sample menus" above referred to (Exhibit F).

In our bid as submitted we made the following offer:

"We have sought to present a schedule of prices which will yield a net return of 6 per cent, and we are willing to interpolate in the contract a stipulation limiting profits to this amount, binding ourselves to disburse at the end of each year for Christmas festivities, for the creation or assistance of an amusement fund, or for such other purposes as the Commission may determine any surplus above a net return of said 6 per cent."

Up to the time of the submission of our proposal these sample menus had not been seen by any person but ourselves and our stenographer. Mr. Shonts thereupon opened our bid and said he would give the matter proper consideration. Our bid proved to be the lowest one of three bids submitted. At about 3 p. m. of the following day, September 6, Mr. Shonts sent to our office, by his secretary, a letter, dated such day (Exhibit G), containing new conditions, to be binding on the bidder, not mentioned in the original specifications, such as requiring the bidder to erect electric-light plants, the number of which was not mentioned, and other requirements regarding the amount and character of linen and towels to be furnished, and concluding with the statement that the writer feared from the prices we had made that we had not considered all the items mentioned in his letter, in consequence of which our prices were lower than they otherwise would be, and offered us the privilege of "revamping" our bid if we cared to do so.

At about 3.15 we obtained possession of Mr. Shonts's letter, and while giving the matter due consideration received a hurried call from the secretary of Mr. Shonts, stating that the latter must have an answer by 4 o'clock of the same day. At 3.30, when we became entirely familiar with the purport of Mr. Shonts's further requirements, calling for the outlay of many thousands of dollars in addition to that called for in the original bid, we set to work, within the half hour given us, to modify our bid. Summoning a stenographer, we dictated a new proposal (Exhibit H) and repaired to Mr. Shonts's office at about 4 o'clock for the purpose of submitting the same. At about 4.30 we were received by Mr. Shonts and gave him our proposal, which he read and made no comment concerning it. We remained with Mr. Shonts until about 5 o'clock, at which time Mr. Ross, who was in the office all during the session, remarked that Mr. Jacob E. Markel, the other bidder, had not yet been heard from, although he had promised to submit his bid by 4 o'clock. On the afternoon of the following day, September 7, Mr. Shonts notified us of the award of the contract to Mr. Markel, and extended to us the privilege of examining his bid. In reading the successful bid we observed that it was dated September 6, while ours was dated Sep-

tember 5, and discovered, under the heading of "Sample menus for one week," the precise menus which we had prepared and submitted with our original bid. Mr. Shonts's secretary, at such time, stated that he intended to take Mr. Markel's bid to Washington the same evening for filing in the office of the Commission.

HOULDER HUDGINS.
CHARLES J. DUMAS.

Signed and sworn to before me this 20th day of September, 1905.

[SEAL.]

JAMES COCHRAN,
Notary Public, Kings County.

Certificate filed in New York County.

In the matter of the award of the privilege of feeding and lodging employees on the Isthmus of Panama.

STATE OF NEW YORK,
County of New York, ss:

We, the undersigned, Hudgins & Dumas, the bidders for the privilege of lodging the employees on the Isthmus of Panama, from the foregoing statement of facts and the exhibits thereto attached, beg to submit the following comments:

1. *The extraordinary haste in the award of the privilege.*—The specifications embodied in the draft contract called for proposals to be submitted within two days, both of which were public holidays. After our bid was submitted strictly in accordance with the specifications, and proved to be the lowest bid, new and onerous conditions were demanded, requiring a decision within half an hour's time, on difficult matters of estimate, such as the erection of an uncertain number of electric-light plants and the furnishing of a large amount of linen, etc. However urgent the necessity for the immediate granting and exercise of the privilege, it is submitted that it can not be for the best interests of the public undertaking at Panama to proceed in the award of a privilege of this kind, involving many millions of dollars, with the haste displayed in this instance.

2. *The peculiar circumstances in connection with the bid of the successful bidder.*—The "weekly menus," which we prepared at Mr. Shonts's request upon our suggestion, were not a part of the general specifications distributed to the bidders. Mr. Shonts's statement to the contrary in his report to the President is clearly erroneous, as no specific menus were incorporated in the specifications sent to either ourselves or, as we are informed, to H. Balfe & Co., the third bidder. Nevertheless, our identical menus, containing specific dishes of food for 21 meals, appeared in the bid of the successful bidder. Considering also that our bid was dated September 5, the date on which Mr. Shonts demanded that bids be first submitted, and the successful bidder's bore date of September 6, and having in mind the extraordinary haste demanded of us in submitting our modified bid, it seems fair to presume that the successful bidder must have had knowledge of the contents of our bid before his bid was submitted.

3. *The relative merit of the two bids.*—Having specifically withdrawn our bid, we feel justified in submitting a dispassionate statement of what we consider the relative worth of the proposals of the successful bidder and ourselves. While, in examining the two bids, we subordinate the matter of prices to the manner of the award, we believe our bid as finally submitted will not suffer by a proper comparison of the figures. The following is a comparison of the bids referred to:

GOLD EMPLOYEES.

	Markel.	Hudgins & Du- mas.
Rooms:		
Month—		
Adults	\$6.00	\$5.00
Children		3.00
Day—		
Adults .....	.20	.50
Children .....		.30
Meals:		
Month—		
Adults	30.00	30.00
Children	10.00	20.00
Day—		
Adults	1.00	1.25
Children .....	.40	.75
Per meal—		
Adults .....	.33½	.50
Children .....	.13	.30

SILVER EMPLOYEES.

Meals:		
Month—		
Adults	\$12.00	\$9.00
Children	5.00	6.00
Day—		
Adults .....	.45	.50
Children .....	.20	.30
Per meal—		
Adults .....	.15	.20
Children .....	.10	.20

Persons 12 years old or over rated as adults.
Persons between 5 and 12 rated as children.

It will be seen that the bids cover estimates for feeding and lodging two classes of employees, the gold and silver employees, the former being those whose salaries are from \$125 to \$600 a month, and the latter whose wages are from \$30 to \$50 a month. Our bid for furnishing rooms per month to the adult gold employees is lower than the successful bidder's, and for furnishing meals per month is at the same rate as the latter's. Our bid for furnishing meals per month to the silver employees is \$9, while that of the successful bidder is \$12, or 33½ per cent higher. As these latter employees are manual laborers, outnumber the other employees ten to one, and will probably in a year or two outnumber them twenty to one, the enormous accretion to the contractor's income from this source can readily be estimated and the injustice of charging such employees 33½ per cent higher for their meals than they could otherwise obtain from us readily understood. The silver employees now number approximately 12,000 men and the gold employees 1,500 men, and we are informed that it is the intention of the Commission to increase the number of the former by 10,000 a year until 50,000 men are employed.

Regarding the question of personal responsibility in the exercise of this privilege, we have but to point to our record as privilege holders at Ellis Island, where we have served food in quantities to immigrants equivalent to 20,000 individual meals in a single day, the food being such as the various nationalities of immigrants were accustomed to at home. The manner in which we discharged our duty in this public undertaking is well known to the President as well as the Hon. George B. Cortelvou, who was Secretary of Commerce and Labor, and the Hon. William Williams, who was commissioner at Ellis Island during our incumbency of such privilege.

4. *The legality of the award.*—Mr. Shonts in his report to the President stated that it had been determined that the granting of this privilege should be handled by the Panama Railroad and not by the Isthmian Canal Commission, and that it was not requisite to invite proposals at all. In his letter of September 1, 1905, to us he distinctly states, "It is the intention of the Commission to furnish the plant, etc.;" "the Commission to have general supervision to see that the spirit of the contract is lived up to by the contractor;" "Commission will require a bond, etc." Also, in his letter of September 6, above referred to, he further says, "It is the purpose of the Commission to limit the sale of foodstuffs, etc., so that our Government can keep the control of the commissaries in its own hands, etc.;" "we will expect the contractor to cooperate with the Commission in its efforts to avoid friction, etc."

The above clearly indicates, it seems to us, that it was the Commission which was to make the award and to be the dominant voice in the exercise of the privileges granted.

The authority for the creation of the Commission and the acquirement of the railroad is first found in an act of Congress, approved January 28, 1902, entitled "An act to provide for the construction of a canal connecting the waters of the Atlantic and Pacific oceans." In this act the acquisition and perpetual maintenance of the Panama Railroad is authorized.

It will be recalled that, pursuant to a suggestion made by the War Department, the Commission was reorganized and announced on the 3d day of April, 1905. The Executive order constituting the Commission and defining the powers and duties of the respective members thereof is dated April 1, 1905, and, among other things, it provides as follows:

"The Commission, under the supervision and direction of the Secretary of War and subject to the approval of the President, is charged with the general duty of the adoption of the plans for the construction and maintenance of the canal and with the execution of the work of the same; with the purchase and delivery of supplies, machinery, and necessary plant; the employment of the necessary officers, employees, and laborers, and with the fixing of the salaries and wages; *with the commercial operation of the Panama Railroad Company and its steamship lines as common carriers; with the utilization of the railroad as a means of constructing the canal; with the making of contracts for construction and excavation and with all other matters incident and necessary to the building of a waterway across the Isthmus of Panama as provided by the act of Congress of June 28, 1902.*"

The status of the chairman of the Commission and his powers are fixed in the order in the following language:

"For convenience of executing the work to be done there shall be constituted three executive departments. The head of the first department shall be the chairman of the Commission, who shall have direct and immediate charge of—

- "(1) The fiscal affairs of the Commission.
- "(2) The purchase and delivery of all materials and supplies.
- "(3) The accounts, bookkeeping, and audits.
- "(4) The commercial operations in the United States of the Panama railroad and steamship lines.

"(5) He shall have charge of the general concerns of the Commission, subject to the supervision and direction of the Secretary of War, and shall perform such other duties as may be placed upon him from time to time by the Secretary of War."

It will be observed that the purchase and delivery of materials and supplies and the commercial operations in the United States of the Panama Railroad Company are expressly placed in the hands of the chairman of the Commission. This seems to be the source of Mr. Shonts's authority, and the manner in which such authority should be exercised seems to be fixed by the further provision in the Executive order, intended to regulate the manner in which contracts incident to the canal work should be awarded. We note in the Executive order the following language:

"Contracts for the purchase of supplies or for construction involving an estimated expenditure exceeding \$10,000 shall only be made after due public advertisement in newspapers of general circulation, and shall be awarded to the lowest responsible bidder, except in case of emergency, when, with the approval of the Secretary of War, advertising may be dispensed with. In the making of contracts for supplies or construction involving an estimated expenditure of more than \$1,000 and less than \$10,000, competitive bids should be secured by invitation or advertisement whenever practicable."

It is manifest that this provision of the executive order should govern the letting of all contracts incident to the work of the Isthmian Commission, whether such contracts are let by the Commission as a whole or by Chairman Shonts, pursuant to the powers vested in him by this executive order.

It is difficult to divorce the Panama Railroad Company as an organization from the Isthmian Canal Commission as a Government board, when it is remembered that the acquisition of the Panama Railroad Company was a mere incident to the construction of the canal, and the Government, as the owner of the railroad, vests the management and operation of it in the Isthmian Canal Commission.

It is a fact that every member of the Canal Commission is also a director in the Panama Railroad Company.

Chairman-President Shonts's explanation that the contract for conducting hotels and maintaining them, for furnishing food supplies to the thousands of laborers who will be congregated in so-called boarding camps, and conferring upon the holder of the contract important and presumably profitable privileges for the sale of supplies in the Zone, is a Panama Railroad matter and not a Commission matter, furnishes no adequate reason for his action in awarding the

contract in the manner in which it is alleged he did. Mr. Shonts admits that the contract was made without public advertisement, yet the language of the executive order explicitly says:

"Contracts for the purchase of supplies * * * involving an estimated expenditure exceeding \$10,000 shall only be made after due public advertisement in the newspapers of general circulation."

If it is attempted to justify this action on any ground of emergency, then the contract could be let without advertisement only by and with the approval of the Secretary of War. It has not yet appeared that such emergency existed or that such authority was asked.

While it may be contended that the granting of this privilege does not involve a contract for the "purchase of supplies or for construction," it is obvious that the duties of the privilege holder are to supply Government employees with suitable board and lodgings and that in the contract of the railroad company with the privilege holder the railroad company stands as surety to the contractor for all obligations which the railroad company's employees have incurred to the latter for board and lodgings supplied on the Isthmus. It is clear, it seems to us, that the contract in question is a public one in all its aspects, and should have been granted only after due advertisement and a reasonable opportunity given bidders to submit bids.

5. *The organization of the successful bidder.*—Mr. Shonts in his report to the President laid great stress upon the superior organization which Mr. Markel was said to possess in the West, upon which he could draw immediately for a sufficient working force to conduct the hotels, boarding camps, and commissary stores in Panama. Mr. Shonts appears to have been so impressed by Mr. Markel's alleged organization and his long experience in the West as to leave no doubt that, in his opinion, the contract should have been awarded to him, even if, as is the case in some respects, his prices were higher than ours. Mr. Shonts devoted considerable space in his report to the President to a description of Mr. Markel's proposed plan, which was to send his present employees to the Isthmus in rotation, withdrawing them from time to time in order that they might recuperate. In thus extolling Mr. Markel's qualifications and plans, Mr. Shonts saw fit to refer disparagingly to the "purely local" organization and experience of ourselves. We admit that our experience has been "purely local," but we submit that hotel management is much the same the world over in fundamental requirements, and that, if anything, we were, and are, better equipped to undertake the commissary contract in Panama than is Mr. Markel. The latter appears not to possess the organization attributed to him by Mr. Shonts, but to be practically dependent upon such help as may be obtained through the employment agencies of this city. As evidence of this we refer you to an interview given by Mr. P. L. Markel, a son of the successful bidder, to the *Kansas City Journal* of September 14, 1905, in which the younger Mr. Markel, who is to be his father's general manager, states that "it will be more convenient to hire those we want in New York, from where we will ship." Furthermore, we are credibly informed that orders have been placed with local employment agencies, through the hotel register of this city, for several hundred chefs, stewards, cooks, and other assistants for service in the Canal Zone.

We feel it is important to call attention to these matters in view of the fact, despite Mr. Shonts's reference to our "purely local" experience, that we had our organization perfected at the time we submitted our bid, and clearly stated to Mr. Shonts that we were prepared to undertake the Panama contract at a moment's notice.

We submit that the reasons advanced by Mr. Shonts in justification of his action in awarding this contract to Mr. Markel are invalid; that he acted possibly in good faith, but without a proper understanding of the facts and a proper regard for the proprieties; that as a result of his action great injustice has been done to ourselves and great injury to us as business men; and we earnestly appeal to you, in the light of the facts submitted, to take appropriate action to annul the contract awarded to Mr. Markel and reopen the same to public competitive bidding.

Respectfully,

HUDGINS & DUMAS.
HOULDA HUDGINS.

EDWARD VAN INGEN, *Attorney.*

WASHINGTON, August 4, 1905.

SHONTS, *Panama:*

Undersigned, lately commissaries Ellis Island immigration station, highest testimonials, desire bid privilege feeding canal employees. Answer if conference desired.

HUDGINS & DUMAS,
21 State Street, New York.

AUGUST 23, 1905.

Hon. THEODORE P. SHONTS,

Chairman Isthmian Canal Commission, Washington, D. C.

DEAR SIR: Believing that the time is near at hand when definite arrangements will be made for the conduct of the commissary in conjunction with the construction of the Panama Canal, we desire to confer with you on this subject at a time and place to be appointed by you.

For the three years ended July 1 last we were the official commissaries at the Ellis Island immigrant station, where we served at times as many as 20,000 meals a day, the food being such as the various nationalities of immigrants were accustomed to at home. We have numerous testimonials of the efficiency of our administration there from officials and others which we shall be pleased to submit to you. These include a strong indorsement from the trans-Atlantic steamship companies, which pay the cost of maintenance of detained immigrants.

The President is thoroughly familiar with our work at Ellis Island, and we feel at liberty to refer you to him as to our capabilities, also to the Hon. George B. Cortelyou, who, as Secretary of Commerce and Labor, made a careful study of the problem; to the Hon. William Williams, now of No. 35 Wall street, New York, who, as commissioner of immigration, was our immediate superior, and to the Hon. Robert Watchorn, the present commissioner at Ellis Island.

For conducting business in Panama we have a valuable experience,

ample capital, and the command at short notice of capable assistants, including natives of the West Indies and men of various other nationalities. All we need is to know what the requirements are, and we assure you that we can be depended upon to meet promptly and satisfactorily any reasonable commissary situation.

Will you not give us an opportunity to ascertain your views upon the pending problem with the object of assisting you and broadening the scope of our activities?

Respectfully,

HUDGINS & DUMAS.

AUGUST 30, 1905.

HON. THEODORE P. SHONTS,

Chairman Isthmian Canal Commission.

DEAR SIR: Pursuant to your suggestion to our Mr. Dumas, we have gone over the canal commissary problem in the light of a further conference with Mr. Walker touching the matter of transportation of supplies, and we beg to state our conclusions as follows:

(1) Because of inevitable losses, breakages, and wear and tear, involving possible disputes as to liability, we suggest that the commissary contractors be required to furnish at the several hotels in the Canal Zone such articles as cutlery, crockery, table linen, and minor accessories.

(2) That while the ten refrigerator cars which Mr. Walker informs us have been offered to you by Messrs. Armour & Co. may ultimately be found to be superabundant, it would be well to use them all until such time as proper refrigeration shall be provided at the hotels. The cars sidetracked where needed would thus supply temporary cold storage, without which the contractors would be at a distinct disadvantage.

(3) That steam laundries be established in conjunction with the hotels for the convenience of employees and to prevent possible infection as a result of promiscuous arrangements; said laundries to be operated by the commissary contractors at prices to be fixed by agreement between the Commission and the contractors.

(4) That the privilege of conducting a general store at each hotel settlement be included in the arrangement to be made with the commissary contractors; everything which may be needed by the two classes of employees to be offered for sale at prices to be fixed by mutual agreement. Local mercantile objections, we think, should not prevail with the Commission against the establishment of these stores, for through them the laborers, whose welfare is a prime consideration, would reap decided advantages in the matter of cost.

(5) As to the food to be served in the hotels, we see no reason why, with proper refrigeration in transit by water and rail, the same grade and variety could not be supplied as in the better class of boarding houses in our cities, and, because of the large number to be served, at lower cost.

If it would assist you, we are prepared to submit, on request, sample menus, covering, say, an entire week. Meanwhile we wish you to feel that you may call upon us at any time for suggestions or such information as we may possess.

Respectfully,

HUDGINS & DUMAS.

SEPTEMBER 1, 1905.

HUDGINS & DUMAS,

Battery Park Building, 24 State street, New York.

GENTLEMEN: I have your letters of August 30 and 31, relative to the canal commissary problem, and beg to advise that I expect to be in New York, at the Panama Railroad Company offices, next Monday and Tuesday, and will be glad to have you send me sample menus for a week, as suggested.

First. It is the intention of the Commission to furnish the plant, holding the contractor responsible for proper running of same, subject to usual wear and tear.

Second. We expect, in addition to cold-storage plant, to construct an ice plant, with capacity of 50 tons per day, which should enable contractor to provide local refrigerator boxes and keep same cooled with ice.

Third. Plans contemplate, in addition to cold-storage and ice plant, steam laundry and bake shop, to be leased to the contractor.

Fourth. Present plans contemplate second and third floors of cold-storage plant for unrefrigerated supplies at a certain rate to contractor. Contractor will have privilege of selling cooked meals at certain prices, and also uncooked, the Commission to have general supervision to see that the spirit of the contract is lived up to by the contractor. Commission will require a bond for faithful performance of duty by contractor, and will have the right to terminate contract unless satisfaction is given. Contractor will furnish all labor.

More detailed plans are being worked out, and will probably be finished to-day. When ready, we will send you a copy. In the meantime, this general sketch may aid you in preparing to make your bid.

Yours, truly,

T. P. SHONTS.

WASHINGTON, D. C., *September 1, 1905.*

MESSRS. HUDGINS & DUMAS,

Battery Park Building, 24 State Street, New York.

DEAR SIR: Referring to your letter of recent date, I send you herewith draft of contract which this company proposes to make for the operation of hotels and boarding camps along the line of its railroad on the Isthmus of Panama.

Mr. Shonts would like to have you make him proposition on the terms outlined in this draft of contract, and, if practicable, he would like to have you deliver it to him at his office at 24 State street, New York City, by 12 noon, Monday, September 4, 1905, as he is desirous of getting the matter closed at as early a date as possible.

Yours, truly,

D. W. ROSS,
General Purchasing Officer.

This agreement, entered into this — day of —, A. D. 1905, between the Panama Railroad Company, a corporation organized and existing under and by virtue of the laws of the State of New

York, hereinafter referred to as the railroad company, and ———, hereinafter referred to as the contractor, witnesseth that:

Whereas the railroad company will have a large number of men in its employ at various places along said line, and the Isthmian Canal Commission will have a large number of employees at work along said line or contiguous thereto;

And whereas such men employed on such work require board and lodging while so employed;

And whereas it is thought that the comfort and convenience of such employees will be insured by providing facilities at the several points where such work is being prosecuted for boarding and lodging and furnishing of supplies to such men as shall see fit to avail themselves of the facilities hereinafter provided for:

Now, therefore, for and in consideration of the covenants and agreements hereinafter set forth to be by the respective parties hereafter kept, done, and performed, it is agreed as follows, to wit:

The railroad company shall furnish the contractor all necessary hotel and camp buildings at such points as it may designate, and shall maintain the same. It shall equip and deliver to the contractor and the contractor shall maintain during the continuance of this agreement all necessary furnishing, bedding, tableware, tinware, cutlery, ranges, refrigerators, cooking utensils, and other equipment ordinarily needed in the operation of such hotels and camps.

The railroad company shall charge the contractor the following rates per hundred pounds for transportation of supplies from New York to Colon, which rates shall cover delivery of the supplies in the refrigerating plant or storeroom to be provided at that point:

For articles requiring refrigeration, 57½ cents.

For articles not requiring refrigeration, 22½ cents.

On articles requiring freezing and storage in refrigerating plant at Colon it shall charge the contractor 40 cents per hundred pounds, which charge shall cover the cost of freezing and of storage in the refrigerating plant at Colon, regardless of the length of time such articles remain in storage, not to exceed thirty days.

The railroad company shall furnish, maintain, and operate such refrigerating plant, and shall assign to the contractor such rooms or room therein as may be necessary from time to time for the storage of his supplies requiring refrigeration. The contractor shall have the right to employ his own men at such refrigerating plant for the purpose of preparing his supplies for shipment to the hotels and camps operated by him under this agreement, and shall hold the railroad company harmless of all acts of his agents or employees which shall be or may become harmful or detrimental to the operation of the remainder of said plant by said railroad company.

The railroad company shall be responsible to the contractor for his supplies while in such plant and for the proper refrigeration of such supplies as require refrigeration.

For all articles not requiring freezing or storage in refrigerating plant at Colon the railroad company shall furnish the contractor storage room, and shall also furnish the contractor room to be occupied by himself and force for general office purposes, and shall charge the contractor as rent for such storage and office room 5 per cent per annum upon the cost of such portion of the building as is so occupied,

such estimate and allotment to be made by the general manager of the railroad company.

The railroad company shall furnish and haul on such trains as may be designated by the general manager of the railroad company such refrigerator and other cars as may be required by the contractor for the distribution of his supplies from the refrigerating plant and storage room at Colon to the stations nearest the hotels and camps operated by him under this agreement and for transporting to Colon or other points any supplies which the contractor may need to send to such points from such hotels and camps or from other stations on the railroad. It shall charge the contractor for such service in either or both directions an amount per day per car used which shall be fixed by the general manager of the railroad company. The contractor shall furnish his own employees for handling such supplies on such cars and to and from such cars. At points where the railroad company shall have facilities for handling supplies from the railroad to the hotels and camps the railroad company shall allow the use of such facilities to the contractor.

The railroad company shall furnish and maintain buildings at Colon for the use as laundry and bakery, and shall equip same with necessary laundry and bakery machinery and tools. Such equipment shall be maintained by the contractor during the continuance of this agreement.

The railroad company shall furnish the contractor necessary supply of water at such hotels, camp buildings, and storerooms without charge.

The railroad company shall furnish the contractor, f. o. b. cars on track at stations at such hotels, camp buildings, and storerooms, a good grade of bituminous coal at six dollars (\$6) per net ton.

Electric light shall be furnished the contractor at cost of the railroad company for use in such hotels, camps, storehouses, etc., at points where electric-light plants are operated by the railroad company or the Isthmian Canal Commission.

The railroad company shall furnish the contractor at cost such ice as may be required by him for actual use at the hotels, camps, and storehouses operated by him under this agreement.

The railroad company shall furnish the contractor transportation on its steamship line New York to Colon and on its railroad from Colon to their destination for his employees at the same rate as it charges the employees of the Isthmian Canal Commission for like service, and shall grant his employees the same rate for return trip to New York as is granted to the employees of such Commission.

The railroad company shall deduct from the wages of its employees and pay to the contractor such amounts as may be due him by such employees for care of room, board, or supplies furnished them by him, and shall arrange to have the Isthmian Canal Commission deduct from the wages of its employees and pay to him such amounts as may be due him by them for room, board, or supplies furnished them by him.

The railroad company shall grant to the contractor and his employees the same hospital privileges enjoyed by its own employees.

The railroad company shall grant to the contractor the free use of its telegraph and telephone lines for the transmission of such mes-

sages as are necessary in connection with the operation of the hotels and camps covered by this agreement.

The railroad company shall furnish the contractor, without charge, a suitable house for occupancy by himself and family.

The contractor shall furnish the railroad company a corporate bond satisfactory to the president of the railroad company in the sum of twenty-five thousand dollars (\$25,000) to insure the faithful performance of his obligations under this agreement.

The contractor shall at all times keep the hotels, camp buildings, and storerooms covered by this agreement, and the premises surrounding same, as well as the furniture, bedding, tableware, tinware, cutlery, ranges, refrigerators, cooking utensils, and other equipment used in and about such buildings in a cleanly and sanitary condition, and shall at all times keep the hotels, camp, and storerooms covered by this agreement open to the inspection of the general manager of the railroad company, or such representative as he may designate, and shall at all times operate the hotels and camps covered by this agreement to the satisfaction of the general manager of the railroad company.

The contractor shall not employ in or about such hotels, camps, or storerooms any person who is or may be objectionable to the railroad company, and shall, upon the request of the railroad company, discharge such objectionable employee or employees.

The contractor shall furnish such employees of the railroad company and the Isthmian Canal Commission as are paid by the railroad company and the Isthmian Canal Commission in gold, and their families, meals, maintenance, and care of rooms at the following rates:

Maintenance and care of room per month per person over 12 years of age, _____.

Maintenance and care of rooms per month per person over 5 and under 12 years of age, _____.

Maintenance and care of rooms per day per person over 12 years of age, _____.

Maintenance and care of rooms per day per person over 5 and under 12 years of age, _____.

Meals per month per person over 12 years of age, _____.

Meals per month per person over 5 and under 12 years of age, _____.

Meals per day per person over 12 years of age, _____.

Meals per day per person over 5 and under 12 years of age, _____.

Meals per meal per person over 12 years of age, _____.

Meals per meal per person over 5 and under 12 years of age, _____.

In case any employee or person covered by above classification who shall have board and lodging, or either, at a monthly rate shall be necessarily absent for a period not less than seven (7) consecutive days in any one month, such person shall be furnished board and lodging, or either, at the monthly and not the per diem rate for the balance of such month.

Any employee or other person in above classification will be furnished an identification card on request to the contractor, which will enable the holder to obtain board and lodging, or single meals, at the monthly or daily rate he has contracted for at any hotel or camp operated by the contractor.

The meals furnished such gold employees and their families shall consist of the following articles and shall be of sufficient amount to satisfy their appetites:

Breakfast.—Fruit, cereal, fruit, meat or eggs, one vegetable, bread and butter, coffee and tea.

Dinner.—Soup, fish, fresh meat, entre, two vegetables, bread and butter, pie or pudding, coffee or tea.

Supper.—Cereal, fish, meat or eggs, fruit sauce or preserves, bread and butter, cake, coffee or tea.

The contractor shall furnish such employees of the railroad company and the Isthmian Canal Commission as are paid by the railroad company and the Isthmian Canal Company in silver, and their families, meals at the following prices:

Meals per month per person over 12 years of age.....	\$.....
Meals per month per person over 5 and under 12 years of age.....	.....
Meals per day per person over 12 years of age.....	.....
Meals per day per person over 5 and under 12 years of age.....	.....
Meals per meal per person over 12 years of age.....	.....
Meals per meal per person over 5 and under 12 years of age.....	.....

In case any employee or person covered by above classification, who shall have board and lodging, or either, at a monthly rate, shall be necessarily absent for a period not less than seven (7) consecutive days in any one month at the monthly, and not the per diem, rate for the balance of such month.

The meals furnished such silver employees and their families shall consist of the following, and shall be of sufficient amount to satisfy their appetites:

Breakfast.—Cereal, fish, bread and butter, coffee or tea.

Dinner.—Soup, meat or fish, two vegetables, bread and butter, pie and pudding, coffee or tea.

Supper.—One meat, consisting of beef, mutton, or pork; one vegetable, consisting of beans, yams, or yucca; bread and butter, sauce or sirup, coffee or tea.

The contractor shall furnish, at his own expense, all of the provisions and supplies used in such hotels and camps, and shall also furnish, at his own expense, all of the cooks, waiters, chambermaids, and other employees required by him in connection with the operation of the hotel and camps covered by this agreement.

The contractor shall be permitted to sell at the hotels operated by him under this agreement, at such prices as may be considered reasonable by the general manager of the railroad company, newspapers, periodicals, books, and such other articles as are usually sold at newsstands in hotels, as well as soft drinks, light wines, beer, cigars, cigarettes, and tobacco.

The contractor shall be permitted and required to keep on hand at the camps operated by him under this agreement, for sale to employees of the railroad company, Isthmian Canal Commission, and Zone government, supplies and provisions, cooked or uncooked, to be sold to such employees at such prices as may be considered reasonable by the general manager of the railroad company.

In consideration of free transportation of the contractor and his employees, where the same shall be furnished, the contractor shall hold harmless the railroad company from and against all claims, demands, suits, judgments, costs, or payments of money of any

nature or kind whatever arising out of personal injuries to or death of said contractor or his employees, while being transported over the steamship and railroad lines of the railroad company, or while at or about the property of said railroad company, under the terms of this agreement.

The contractor shall use every precaution to prevent damage by fire to the buildings and other property of the railroad company.

In the event that the contractor shall not perform his obligations under this agreement to the satisfaction of the general manager of the railroad company, the railroad company shall have the right to cancel this agreement at any time upon giving thirty days' notice to the contractor of such desire on its part.

If the railroad company elects to cancel this agreement at any time for the reason stated, the railroad company shall purchase from the contractor such supplies and provisions as he may have on hand at the storerooms, hotels, or camps or in transit at cost price.

Upon the termination of this agreement the contractor shall turn over to the railroad company the buildings, furniture, bedding, tableware, tinware, cutlery, ranges, refrigerators, cooking utensils, and all other equipment furnished him under this agreement by the railroad company in the same condition as when received by him from the railroad company, reasonable or ordinary wear and tear excepted.

This agreement shall take effect on the — day of —, A. D. 1905, and shall continue for the term of five years from such date.

The contractor shall not have the right to transfer this agreement or sublet any buildings or premises covered by it to any other individual, firm, or corporation, without the written consent of the president of the railroad company.

This contract vests in the contractor exclusive rights in the matters herein provided for during the continuance of this agreement.

Witness the signatures and seals of the parties hereto, thereto duly authorized, to this and a duplicate instrument of like tenor and effect, the day and year first above written.

PANAMA RAILROAD COMPANY,
By ———, *as President.*
————, *Contractor.*

Witnesses:

SEPTEMBER 5, 1905.

HON. THEODORE P. SHONTS,
Chairman Isthmian Canal Commission,
24 State Street, New York City.

DEAR SIR: Subject to the conditions set forth in the proposed contract for conducting hotels and boarding camps on the Isthmus of Panama, the undersigned beg leave to submit the following estimate, with the understanding that the figures for "maintenance and care of rooms" are based upon the expectation of the occupancy of one room by one person. Should it develop that families occupy these rooms, or, that dormitory arrangements are intended, the cost per

capita would be correspondingly reduced, and we would modify our prices accordingly in this respect.

The estimate for the "rooms" includes cost of lighting same and contemplates a plentiful supply of clean bed linen and towels. All charges, of course, are payable in American gold or its equivalent.

Maintenance and care of rooms per month per person over 12 years of age	\$3.00
Maintenance and care of rooms per month per person over 5 years and under 12 years of age	2.00
Maintenance and care of rooms per day per person over 12 years of age	.20
Maintenance and care of rooms per day per person over 5 and under 12 years of age	.10
Meals per month per person over 12 years of age	14.00
Meals per month per person over 5 and under 12 years of age	10.00
Meals per day per person over 12 years of age	.60
Meals per day per person over 5 and under 12 years of age	.40
Meals per meal per person over 12 years of age	.25
Meals per meal per person over 5 and under 12 years of age	.20

For such employees of the railroad company and the Isthmian Canal Commission as are paid by the railroad company and the Isthmian Canal Commission, in silver, and their families:

Meals per month per person over 12 years of age	\$6.00
Meals per month per person over 5 and under 12 years of age	3.00
Meals per day per person over 12 years of age	.25
Meals per day per person over 5 and under 12 years of age	.15
Meals per meal per person over 12 years of age:	
Breakfast	.08
Dinner	.12
Supper	.08
Meals per meal per person over 5 and under 12 years of age:	
Breakfast	.05
Dinner	.10
Supper	.05

We assume that the meals specified are not arbitrarily fixed, but are intended rather to convey an idea of the grade of service required. Our proposal is made with this understanding, and we should expect to change the bill of fare every day, having due regard to climatic conditions and national dietary tastes, and serving the best food obtainable; in short, to interpret the contract in the same liberal spirit which characterized our administration of the Ellis Island commissariat.

In arranging the foregoing scale of prices allowance has been made for inevitable difficulties to be surmounted at the outset of the contract, which will undoubtedly increase the cost of operation; also (to meet the contingency of illness) for the employment of a larger force than would be needed to perform the same work in an equable climate.

We have sought to present a schedule of prices which will yield a net return of 6 per cent, and we are willing to interpolate in the contract a stipulation limiting profits to this amount, binding ourselves to disburse at the end of each year for Christmas festivities, for the creation or assistance of an amusement fund, or for such other purposes as the Commission may determine, any surplus above a net return of said 6 per cent.

The foregoing arrangement might continue throughout the term of this contract, or if the Commission prefer, we will agree to make a reduction in prices proportioned to the indicated surplus above said 6 per cent, it being understood and agreed that we will purchase

supplies at the ——— lowest market prices, taking advantage of all discounts, and practicing sensible economies.

It is peculiarly apparent that a contract of this character and of the proportions outlined must depend for its satisfactory execution upon the experience, ability, and financial standing of whoever undertakes it. As to our qualifications, we beg to refer you to the affidavit which accompanied our recent bid for a renewal of the Ellis Island concession, a copy of which we inclose. As to our financial standing, we are prepared to furnish cash capital up to the sum of \$200,000 and we can command unlimited credit.

Furthermore, if the contract should be awarded to us, we will pledge ourselves to give our undivided personal attention to it, and to cooperate with the Commission in every way in which our services may be availed of in promoting the comfort and welfare of the thousands of workers employed in this great undertaking.

In carrying on this work we should have the assistance of a staff of competent hotel managers, stewards, and heads of departments, each possessing special qualifications for the performance of the duties to be assigned to him.

We submit, as you request, sample menus for a week for the hotels. As we indicated in our communication of August 30, we believe the grade and variety of the food should approximate those of high-class American boarding houses, and the menus submitted are subject, of course, to almost illimitable changes. For the boarding camps, or "silver" employees, we should amplify, as far as might be practicable, the bill of fare given in the draft of the proposed contract.

Respectfully,

HUDGINS & DUMAS.

Sample menus submitted by Hudgins & Dumas for Canal Zone hotels, covering a period of one week.

SUNDAY.—*Breakfast:* Baked apples, whipped cream, broiled bluefish, hot waffles, lamb chops, fried potatoes, bread and butter, coffee, tea, or cocoa. *Dinner:* Chicken soup, boiled turkey, oyster sauce, roast ham, sauce Robert, prime ribs of beef, bread and butter, green peas, mashed potatoes, celery, ice cream, homemade cake, mixed fruits, nuts and raisins, coffee. *Supper:* Pork and beans, cold cuts of beef and ham, Vienna rolls and butter, canned peaches, blackberry mush, homemade cake, mixed fruits, nuts and raisins, crackers and cheese, iced tea.

MONDAY.—*Breakfast:* Grape fruit, boiled rice, cream and sugar, scrambled eggs with bacon, hot corn bread, Spanish rolls, butter, boiled salt mackerel, coffee, tea, or cocoa. *Dinner:* Barley broth, boiled haddock, egg sauce, roast leg of lamb, caper sauce, banana fruites, succotash, baked sweet potatoes, bread and butter, homemade pie, cheese, coffee, tea, or cocoa. *Supper:* Farina, cream, sugar, sliced cervelat, cold corned beef, potato croquettes, Sally Lun (a hot cake), preserves, coffee, tea, or cocoa.

TUESDAY.—*Breakfast:* Sliced fruit with cream, cereal, fried native fish, beefsteak, German fried potatoes, wheat muffins, bread and butter, coffee, tea, or cocoa. *Dinner:* Vermicelli soup, sardines, veal cut-

let, stewed ox tails, mashed potatoes, spaghetti au gratin, boiled spinach; peach roly-poly, vanilla sauce; crackers and cheese, coffee, tea, or cocoa. *Supper:* Boiled Indian meal with cream, curry of lamb, baked potatoes, mixed pickles, vienna rolls, butter, nut cake, raspberry jam, coffee, tea, or cocoa.

WEDNESDAY.—*Breakfast:* American apples, cream of wheat, poached eggs on toast, liver and bacon, wheat cakes with sirup, coffee, tea, or cocoa. *Dinner:* Mock turtle soup; fried codfish, tomato sauce; beef a la mode with dumpling, boiled onions, string beans, lemon ice, cold cabinet pudding, coffee, tea, or cocoa. *Supper:* Hominy, cold roast lamb, chipped beef, creamed potatoes, pickled beets, preserved apricots, chowchow, crackers, cheese, coffee, tea, or cocoa.

THURSDAY.—*Breakfast:* Grape fruit, bananas, cereal, Spanish mackerel, lamb chops, lyonnaise potatoes, hot corn bread, tea, coffee, or cocoa. *Dinner:* Split-pea soup; baked native fish, tartar sauce; chicken fricassee, sirloin steak, baked potatoes, olives, stewed tomatoes, bread fruit, strawberry ice cream, cake, coffee, tea, or cocoa. *Supper:* Wheaten grits, Hamburg steak, bacon and lamb's kidneys, German fried potatoes, French toast, stewed prunes, bread and butter, coffee, tea, or cocoa.

FRIDAY.—*Breakfast:* Flaked rice with canned peaches; codfish cakes, tomato sauce; omelet with bacon, Vienna rolls, butter, coffee, tea, or cocoa. *Dinner:* Puree of tomato soup, baked spaghetti, baked fish stuffed, prime ribs of beef, mashed turnips, green pease, boiled beets, bread and butter, cornstarch pudding, coffee, tea, or cocoa. *Supper:* Force with cream, pickled herring, table celery, Frankfurt sausage, sauerkraut, stewed peaches, johnnycake, crackers and cheese, coffee, tea, or cocoa.

SATURDAY.—*Breakfast:* Fruit, cold boiled rice, cream, sugar, mutton chops, frizzled beef with eggs, Spanish rolls and butter; coffee, tea, or cocoa. *Dinner:* Mutton barley broth, fried fish, bread, fruit, porterhouse steak, fried onions, boiled potatoes, spinach, Sally Lunn, cornstarch custard, mixed fruits; coffee, tea, or cocoa. *Supper:* Boiled Indian meal; sirup; cold corned beef; veal chops, breaded; molasses cake; graham crackers; canned peaches; coffee, tea, or cocoa.

NEW YORK, *September 6, 1905.*

HUDGINS & DUMAS, *New York.*

GENTLEMEN: Referring to your bid for feeding employees on the Isthmus, etc., I note, first, you state that your estimate for "rooms" includes "cost of lighting same," and "contemplates a plentiful supply of clean bed linen and towels."

In order that there may be no misunderstanding, beg leave to advise that where neither the railroad nor Commission own electric plants, as mentioned in our specifications, we would expect the contractor to put in small electric-light plants, such as are used in this country, as kerosene is too dangerous a commodity to have around our buildings.

In regard to bed linen and towels, would say the Commission would expect the bed linen to be changed daily, and one bath towel and two hand towels to be furnished for each person each day, besides a supply of roller towels in the public wash room. The bath towels should be at least 24 by 48 and the hand towels 17 by 34 inches in size.

I also desire to call your attention to the large amount of veranda space surrounding the hotels. These verandas, as well as the walks and grounds around the hotels, must all be kept in a thoroughly clean and sanitary condition. I inclose you a photograph of the Culebra Hotel, in order that you may have an idea of the amount of veranda space to be kept in order. This, in addition to the interior of the hotel, must be taken into consideration in figuring on the maintenance and care of rooms.

In a general way, our gold employees are men of education and refinement, who draw salaries of from \$125 to \$600 a month, and are used to not only comforts, but many of the luxuries of life. The service and meals we would expect furnished this class of employees must be of a high grade, both in quality of material cooked and in the manner of serving at the table, and should approximate the service of a \$2 hotel in the States. In view of the climatic conditions, I desire also to call your attention to the fact that it will be necessary to ship only the best grade of export meats to the Isthmus.

In regard to service for silver men: It is expected that the houses and surroundings in which silver men are fed shall also be kept in a neat, clean, and sanitary condition, and that the cooking utensils and tableware shall be kept clean and sanitary. In order to accomplish the latter it will be necessary to sterilize same after each meal. The tables will be covered by white oilcloth, kept clean. Again, in order to prevent all misunderstanding, would say that the price of meals for silver men must include the care of the buildings, grounds, tables, cooking utensils, etc., as, so far as they are concerned, there is no care for rooms.

In regard to the sale of uncooked food, the contract contemplates not only the sale of cooked and of uncooked foods, but the other items mentioned. So far as tobacco and cigarettes are concerned, that is governed by concessions sold by the Panaman Government each year, and the contractor would either have to pay duty or buy from the concessionaire who controls that business on the Isthmus. It is not intended that the contractor will sell general commissary goods outside of uncooked goods and the articles mentioned, for the reason that there is a treaty obligation between the United States Government and the Panaman Government, limiting the sale of commissaries to certain classes of employees, and it is the purpose of the Commission to limit the sale of food stuffs, etc., to the items mentioned in our specifications, so that our Government can keep the control of the commissaries in its own hands, so as to regulate it as occasion requires. We will expect the contractor to cooperate with the Commission in its efforts to avoid friction as between the two Governments.

It is the intention of this agreement to limit the sale of these cooked and uncooked foods and other items mentioned to employees of the Commission and of the railroad company, but not to do a general merchandising business. I mention this particularly, fearing that this is not clearly understood by you and that you did not consider this fully in making up your prices for meals.

It is also clearly understood that the prices shown in the specifications for freights on steamships and in cold storage is limited entirely to goods used in feeding the railroad company and Canal Commission employees, and not to outsiders.

You also understand that the yams, yuccas, and dried fish, required by the Jamaican laborers, can not be secured any place except on their island. I presume you are familiar with the methods required to procure these supplies and the cost of same, as they will be a very prominent item in the food required by this class of labor.

To be entirely frank, I fear from the prices you have made that you have not considered all of the items mentioned in this letter, and that therefore your prices are lower than they otherwise would be. In order that there may be no misunderstanding, and because we do not wish to take any advantage, I send you this communication, and give you the privilege of revamping your figures in view of this letter, if you desire to do so.

Would like to hear from you this afternoon relative to this matter.

Yours, truly,

D. W. Ross.

SEPTEMBER 6, 1905.

HON. THEODORE P. SHONTS,
Chairman Isthmian Canal Commission,
24 State Street, New York.

DEAR SIR: In view of the better understanding of the conditions of the commissary contract on the Isthmus of Panama arrived at after reading your favor of even date, we avail ourselves of the opportunity to revise our figures, as many of the things we had figured would be supplied by the railroad company we now learn will have to be furnished by us.

In order to facilitate matters we shall not follow the exact language of the specifications, but state the figures briefly, believing you will understand their relations.

GOLD EMPLOYEES.

Meals per month per person over 12 years of age.....	\$30. 00
Meals per month per person over 5 years and under 12 years of age.....	20. 00
Meals per day per person over 12 years of age.....	1. 25
Meals per day per person over 5 and under 12 years of age.....	. 75
Meals per meal per person over 12 years of age.....	. 50
Meals per meal per person over 5 and under 12 years of age.....	. 30
Maintenance and care of rooms per month per person over 12 years of age..	5. 00
Maintenance and care of rooms per month per person over 5 years and under 12 years of age.....	3. 00
Maintenance and care of rooms per day per person over 12 years of age..	. 50
Maintenance and care of rooms per day per person over 5 and under 12 years of age.....	. 30

Silver employees.

Meals per month per person over 12 years of age.....	\$9. 00
Meals per month per person over 5 and under 12 years of age.....	6. 00
Meals per day per person over 12 years of age.....	. 50
Meals per day per person over 5 and under 12 years of age.....	. 30
Meals per meal per person regardless of age.....	. 20

We note what you say in regard to the character and source of supplies needed to feed Jamaican laborers, and we beg to say that

we have figured upon obtaining these supplies in Jamaica. Our figures for meals and maintenance, it is proper to add, are based upon the expectation that ample facilities in the matter of cold-storage transportation will be provided by the Government. With such facilities we see our way clear to perform the contract. If, however, it would be more satisfactory to the Commission, we are prepared to proceed on a basis of 6 per cent net on the volume of the business done, at prices to be fixed by mutual agreement, and a refund, as suggested in our previous communication, of any surplus.

Respectfully,

HUDGINS & DUMAS.

ISTHMIAN CANAL.

SENATE COMMITTEE ON INTEROCEANIC CANALS,
Washington, D. C., Monday, March 5, 1906.

The committee met at 2 o'clock p. m. (only an executive session having been held on Saturday, March 3).

Present: Senators Millard (chairman), Kittredge, Knox, Ankeny, Morgan, and Taliaferro.

TESTIMONY OF JACOB E. MARKEL—Continued.

The CHAIRMAN. Proceed, Senator Taliaferro, if you are ready.

Senator TALIAFERRO. Mr. Markel, I understood you to say in your testimony on Friday that the menu submitted in your bid was a menu prepared by yourself?

Mr. MARKEL. That is, the original bid; yes, sir.

Senator TALIAFERRO. Was there any subsequent bid?

Mr. MARKEL. No, sir.

Senator TALIAFERRO. Why did you say the original bid then?

Mr. MARKEL. The original bid was the advertisement for the concession. There was a menu in that.

Senator TALIAFERRO. You stated, Mr. Markel, that you did not see, so far as you knew, or, at any rate, that you did not use the menu of Hudgins & Dumas?

Mr. MARKEL. No, sir.

Senator TALIAFERRO. Was not that your statement?

Mr. MARKEL. Yes, sir.

Senator TALIAFERRO. You repeat that statement?

Mr. MARKEL. Yes, sir.

Senator TALIAFERRO. Mr. Shonts, in his testimony, volume 1 of the hearings, pages 457 and 458, seems to be under the impression that he gave you the Hudgins & Dumas menu.

Mr. MARKEL. Well, sir, I have no knowledge of it. I imagine if he wanted to make it a part of the contract and had a copy there, he could have attached it. Our menus were identically the same as far as the articles were concerned, and as far as the food value was concerned. The arrangement of the menu was not, in my judgment, a matter of any importance. Whether they attached one of Hudgins & Dumas's menus to my papers I do not know. I did not.

Senator TALIAFERRO. And you never saw one of them?

Mr. MARKEL. Not until after the contract was signed and delivered. I never saw any of the Hudgins & Dumas papers.

Senator TALIAFERRO. Senator Simmons asked Mr. Shonts this question: "I will ask you if you, or anyone in the office, so far as you know, showed this menu which accompanied Hudgins & Dumas's bid, to Mr. Markel before he put in his bid?"

"Mr. SHONTS. I suppose a copy of it was given to him. That is what I wanted done, so that he would bid on the same specifications."

Mr. MARKEL. I have no recollection of its being delivered to me, and I think I would have known it if it had been.

Senator TALIAFERRO. This statement that you left with the committee, illustrating what the operation of your contract would have been if it had gone into operation——

Mr. MARKEL. And if that number of men had been at the hotels and camps.

Senator TALIAFERRO. That statement is full and complete?

Mr. MARKEL. Yes, sir.

Senator TALIAFERRO. That is what you regard as a fair illustration of the manner in which your contract would have operated the first year if it had gone into effect?

Mr. MARKEL. Yes, sir; and if there had been that number of men.

Senator TALIAFERRO. Of course.

Mr. MARKEL. You understand, Senator, that in making up those figures I included earnings from all sources. For instance, in figuring up what would be the earnings from the hotel I figured them at \$36 per month. That included the keep of the rooms, the furnishing of the laundry, and all those things that went toward the keep of the rooms; and in that statement you will find a sheet itemizing what those expenses would be. That of course was simply figured on the proposition that there would be so many men on the gold roll and so many men on the silver roll, and figured at the maximum, of course.

Senator TALIAFERRO. Perhaps you had better get that statement before you, Mr. Markel; it is on page 1312. In that statement it appears that under the operation of this contract your earnings for the first year would have been \$14,688.

Mr. MARKEL. Net.

Senator TALIAFERRO. Net earnings.

Mr. MARKEL. Yes, sir.

Senator TALIAFERRO. That includes all of these things? That was what you estimated your contract would net you?

Mr. MARKEL. Yes.

Senator TALIAFERRO. No more, no less, under this number of white and colored people that you have used as an illustration?

Mr. MARKEL. Yes, sir; estimating that there would be that many men.

Senator TALIAFERRO. Then, Mr. Markel, why did you state to this committee, under that condition of facts, that if you had operated your contract for two months you would have earned your full expenses which the Government paid you, amounting to five thousand seven hundred and how many dollars?

Mr. MARKEL. I have no remembrance of making that statement.

Senator TALIAFERRO. Let us see if you did not make it, Mr. Markel. I refer to page 1304 of the record. [Reading:]

"Mr. MARKEL. Yes, sir; for the simple reason that at the end of the first thirty days—they could not cancel it under thirty days—at the end of the thirty days I would have had profit enough to make me whole on the money that I had expended in getting my organization going."

Mr. MARKEL. Yes, sir. I had reference to the railroad fare and expenses of getting my men from New York to the Isthmus.

Senator TALIAFERRO. Mr. Markel, I think if you will reflect you will find that you are mistaken, as the succeeding question will show. Senator Kittredge then asked you: "And the \$5,000 besides?" To which you answered: "No, sir; not the \$5,000 besides."

Mr. MARKEL. Yes, sir.

Senator TALIAFERRO. To what was Senator Kittredge referring but the amount which had been paid to you by the Government—\$10,715? Did you not understand that he was referring to that?

Mr. MARKEL. No, sir; I had no way of knowing what was in the mind of Senator Kittredge.

Senator TALIAFERRO. What did you suppose he was referring to? Did you not suppose that he was referring to the expenses that you would have been put to in getting your organization complete and in doing whatever was necessary to feed those men on the Isthmus up to and including the two months which you estimated the contract must operate for you to get back that money?

Mr. MARKEL. Just before that question, Senator Taliaferro, I was asked what would be my position had the railroad company decided to avail themselves of the 30-day clause after I had gotten my money into the business. My reply to that was that I had to take the usual business man's chances; and I took into consideration the fact that the contract said that on their canceling the contract they would purchase from me any material on hand, either at the houses or in the store-room or in transit, and assume any food contracts that I was bound up in. My loss, if there had been any, or my gain, would simply be what money I had spent in getting my men from their homes to the Isthmus, and whatever time they had been there. I did not understand Senator Kittredge to mean this payment that was made to me. I was answering that as a proposition of what I thought was my position in case the contract was canceled.

Senator TALIAFERRO (reading from the record). "I knew I had a valuable contract there, and I knew that I could enforce it if I wanted to go into court and make trouble, but I am not built that way."

Then, Mr. Markel, you desire to correct an impression made upon this committee—for I think the committee shares my impression—that you would have made in the first two months of the operation of your contract, if it had gone into operation, enough to have paid you the expenses you had been put to in going down there and making all these investigations, and getting your force there, and operating the contract for two months?

Mr. MARKEL. No, sir; that is not what I meant.

Senator TALIAFERRO. You wish to correct that impression if it exists?

Mr. MARKEL. Yes. I wish to put it in this way: That should that contract have been canceled at one or two months it was my idea that the railroad company would reimburse me for any goods that I had on hand.

Senator TALIAFERRO. That is provided for in the contract.

Mr. MARKEL. Yes, sir. Now, then, my loss, if any, would have simply been what it had cost me to get my men from their homes to the Isthmus. I had in mind, and I was perfectly willing to take a business man's chance in spending my money to go and investigate it. That is what I meant. I simply meant the three or four or five hundred or a thousand or two thousand dollars, whatever it cost, after the contract had been signed, to get my men from their homes to the Isthmus and

to get them back. I did not mean, and if this committee understood me that I meant that I would get back the \$11,000——

Senator TALIAFERRO. No; not the \$11,000.

Mr. MARKEL. Or the seven——

Senator TALIAFERRO. Not the seven.

Mr. MARKEL. The \$5,750?

Senator TALIAFERRO. Is not that what you understood, Senator Kittredge?

Senator KITTREDGE. I certainly understood that the witness testified that if he had been permitted to go on with this contract he would have made during the time stated sufficient to pay his expenses in getting an organization together. Then I asked the question whether he had in mind the \$5,000 as his personal compensation besides. That is what I had in mind when I asked the question.

Mr. MARKEL. Well, I did not understand it that way. What I meant by my testimony was that as to whatever amount I had expended from the time the contract was signed and delivered, and in connection with my having gone on and gotten my men together, that I was taking a business man's chance, and that, in my judgment, if the contract was cancelled in sixty days or thirty days or six months that I would have made enough out of it by getting costs for my goods so that I would not be out any more than what it cost me to get my men down there. I did not have in mind my former expenses.

Senator TALIAFERRO. Then, Mr. Markel, of course you wish to correct the further impression that you made on the committee in your testimony on Friday, that this was a desirable contract for you to hold on to, even for thirty days?

Mr. MARKEL. I did not intend to give that impression for thirty days, and if you will read my testimony I can not see how anybody can construe it that way.

Senator TALIAFERRO. I do not see, Mr. Markel, if you will pardon the suggestion, how anybody who reads the testimony can construe it otherwise, or I would not have put the question. I tried here for fifteen or twenty minutes to get you to admit to this committee, in view of the suggestion that the railroad company would avail itself of that thirty-day cancellation clause if you did not consent to an immediate cancellation of that contract, that under those circumstances you desired the contract canceled immediately, and you persisted in saying that you did not want it canceled and that you regarded it as being to your interest that it should not be canceled, but that as an act of patriotism you were willing to do it, and because of your confidence in the fairness of Mr. Shonts.

Mr. MARKEL. Yes, sir; that is the fact.

Senator TALIAFERRO. You adhere, then, to the proposition?

Mr. MARKEL. I adhere to this, Senator Taliaferro, that I considered that a profitable contract.

Senator TALIAFERRO. One moment, Mr. Markel. When you stated that before I asked the question distinctly, with the suggestion of the cancellation in thirty days.

Mr. MARKEL. Why, I thoroughly understood that. It was in the contract. I knew that it could be canceled any time on giving me thirty days' notice.

Senator TALIAFERRO. You misunderstand me.

Mr. MARKEL. Well?

Senator MORGAN. Notwithstanding that, you considered it a profitable contract?

Mr. MARKEL. Yes, sir.

Senator MORGAN. Notwithstanding that they could cancel it on thirty days' notice, he still considered it a profitable contract.

Senator TALIAFERRO. The witness stated on Friday that he considered it a profitable contract even after it had been suggested to him that it would be canceled in thirty days.

Senator MORGAN. Oh, I see.

Mr. MARKEL. I did not suppose that the contract was going to be canceled.

Senator TALIAFERRO. Did they not tell you that it was?

Mr. MARKEL. No, sir; they did not.

Senator TALIAFERRO. Why, then, did you say to Mr. Shonts: "If you are going to cancel it in thirty days, you might just as well cancel it now?"

Mr. MARKEL. I said just what I meant. But I was under the impression that when we got to the Isthmus the misunderstanding that seemed to prevail would be cleared up and that the contract would be carried out. I did not think that contract was going to be canceled. I never thought it until the morning I got the notice of the cancellation.

Senator KNOX. Did you not consent that it might be canceled?

Mr. MARKEL. Yes, sir; I consented to waive the thirty days' clause.

Senator KNOX. There was no thirty days' clause that permitted them to cancel the contract unless you were in default in carrying it out. That was not an arbitrary clause.

Senator TALIAFERRO. I think it was, Senator.

Senator KNOX. No; not until after he consented that it should be made so.

Senator TALIAFERRO. I think it is incorporated in the contract. That is my understanding.

Senator KNOX. My recollection is to the contrary.

Senator TALIAFERRO. I have not read it, but the witness stated that it was in the contract.

Senator KNOX. I think the witness is mistaken.

Mr. MARKEL. Would the Senator permit me to explain that?

Senator KNOX. Certainly, sir.

Mr. MARKEL. The contract in two or three places anyway, maybe more, says that the provisions of that contract are to be executed to the satisfaction of the general manager. He was the man to decide whether I executed it properly or not.

When I got to New York to take up that contract I found a cablegram there from the general manager of the railroad, protesting against the contract and recommending that it should be canceled. I had no information as to what was the trouble; neither had Mr. Shonts. I do know that when I was on the Isthmus the first time Mr. Stevens was decidedly in favor of a contract system.

Senator KNOX. You see, the contract does not give them the arbitrary right to cancel on thirty days' notice. It is just as I thought: "In the event that the contractor shall not perform his obligations under this agreement to the satisfaction of the general manager," then they shall have the power to cancel it on thirty days' notice.

Mr. MARKEL. Yes, sir.

Senator KNOX. They do not make the general manager an arbitrary judge of the contract.

Senator TALIAFERRO. Mr. Chairman, I recall the former testimony here of Mr. Shonts or Mr. Stevens or of some witness that this thirty days' cancellation clause was subsequently agreed on by Mr. Markel.

Senator KNOX. That is right. That was done by cable.

Senator TALIAFERRO. Yes. I had remembered that, but the witness testified here on Friday, as I recall, that the thirty days' cancellation clause was in the contract from the beginning.

Mr. MARKEL. It was, sir.

Senator TALIAFERRO. That was his testimony, and I was proceeding to interrogate the witness on the points involved in his testimony here Friday.

Mr. MARKEL. Because we discussed that once, Senator, and I wanted to make it ninety days, and Mr. Shonts wanted to make it ten. It was finally made thirty days.

Senator TALIAFERRO. With the facts now before you, do you adhere to the statement that after you had been notified that that thirty-day clause could be availed of by the railway commission, and your contract canceled in thirty days, it was a profitable contract, and you did not want it canceled at once?

Mr. MARKEL. They did not tell me that, Senator.

Senator TALIAFERRO. What did they tell you?

Mr. MARKEL. They told me that we would go to the Isthmus and see what was the matter.

Senator TALIAFERRO. Well, you went to the Isthmus?

Mr. MARKEL. Yes, sir.

Senator TALIAFERRO. What was the matter?

Mr. MARKEL. Well, there was the opposition of the general manager.

Senator TALIAFERRO. Did not the general manager tell you that the contract was going to be canceled under that thirty days' provision?

Mr. MARKEL. No, sir; the general manager did not.

Senator MORGAN. The general manager of what?

Mr. MARKEL. Of the railroad; the chief engineer of the canal; Mr. John F. Stevens.

Senator MORGAN. He was not the chief engineer. He was the general manager. He was the president of the canal company.

Mr. MARKEL. No; Mr. Stevens was.

Senator MORGAN. And was also general manager of the railway company?

Mr. MARKEL. Mr. Stevens?

Senator MORGAN. No; Mr. Shonts.

Mr. MARKEL. I was talking about Mr. Stevens, Senator.

Senator MORGAN. Oh, yes.

Mr. MARKEL. I thought you asked me who was the general manager of the railroad.

Senator MORGAN. I did ask you, and I thought you said Mr. Shonts.

Mr. MARKEL. No, sir; I said Mr. Stevens.

Senator MORGAN. I would like you to state the names of every official of any kind or character with whom you had any dealings in respect to this contract, either in the making of it, or the modification of it, or the cancellation of it, or the payments that took place in virtue of it. I would like you to name every individual that you can recollect with whom you had any official relations in that business.

Mr. MARKEL. Well, there was Chairman Shonts, Governor Magoon, and I think that is about all. Of course, I had conversations with other officials, but not officially.

Senator MORGAN. Or those with whom you had any dealings. You include Wallace in that category?

Mr. MARKEL. Mr. Wallace had resigned.

Senator MORGAN. Before you commenced making your contract?

Mr. MARKEL. Yes, sir. The history of that was, Senator, that I arranged with Mr. Wallace to go there, and on my way to New York—

Senator MORGAN. He passed you coming up?

Mr. MARKEL. No; I met him in New York.

Senator MORGAN. In New York?

Mr. MARKEL. Yes; two or three days, or a couple of days, before he had the interview with the Secretary of War.

Senator MORGAN. Have you mentioned every person who was an officer with whom you had any official relations in regard to that contract?

Mr. MARKEL. Yes, sir.

Senator MORGAN. Either of the railroad or the Panama Canal Commission?

Mr. MARKEL. Yes, sir.

Senator MORGAN. Who was it that determined to pay you this sum of money—ten thousand and odd dollars?

Mr. MARKEL. I think that was the board of directors of the railroad company.

Senator MORGAN. Do you know that?

Mr. MARKEL. Why, yes; the voucher that I signed was a resolution of the railroad company.

Senator MORGAN. Who was present when that resolution was passed?

Mr. MARKEL. I do not know, sir.

Senator MORGAN. Was there any meeting of the Commissioners?

Mr. MARKEL. There was a meeting of the railroad directors.

Senator MORGAN. A meeting of the board of directors of the railroad company?

Mr. MARKEL. Yes, sir.

Senator MORGAN. Who was present at that meeting?

Mr. MARKEL. I do not know. I was not present.

Senator MORGAN. Do you know that any meeting was held?

Mr. MARKEL. Yes, sir; I know there was one held, because I was in the outer office.

Senator MORGAN. Where was it held?

Mr. MARKEL. At the office of the railroad company, at 24 State street, New York.

Senator MORGAN. In New York?

Mr. MARKEL. Yes, sir.

Senator MORGAN. As you were in the next room to that in which the meeting was held, can you not state?

Mr. MARKEL. I was out in the anteroom. I saw there that day Mr. Shonts, Mr. Cromwell, General Ernst, Major Harrod, Admiral Endicott—I do not remember any others.

Senator MORGAN. You are quite sure that you have given all that you saw there?

Mr. MARKEL. I am not sure of that. I think it is all that I saw.

Senator MORGAN. It purported to be, I suppose, a regular board meeting?

Mr. MARKEL. Yes, sir.

Senator MORGAN. Of the railroad directors?

Mr. MARKEL. Yes, sir.

Senator MORGAN. Was there a quorum of that board present?

Mr. MARKEL. I should think so.

Senator MORGAN. You have named all that you can mention?

Mr. MARKEL. Yes, sir. I think the proceedings of the board would show, Senator. Of course, I personally knew nothing about it. I was not in the room. After the board had adjourned and they had passed the resolution I was settled with.

Senator MORGAN. I am speaking of the meeting when this resolution to pay you was adopted.

Mr. MARKEL. That was November 8.

Senator MORGAN. That is the time at which your contract was actually canceled and you were paid?

Mr. MARKEL. The contract was actually canceled October 9, on the Isthmus.

Senator MORGAN. By whom?

Mr. MARKEL. By Mr. Shonts.

Senator MORGAN. That was no board meeting that did that?

Mr. MARKEL. No, sir; that was done by Mr. Shonts and Governor Magoon and Mr. Stevens and a man named Jackson Smith.

Senator MORGAN. The contract when made and signed by you first was not authorized by any meeting of a board of directors that you know of?

Mr. MARKEL. No, sir; I do not know.

Senator MORGAN. You are quite sure it was not?

Mr. MARKEL. I do not know.

Senator MORGAN. You dealt with Mr. Shonts?

Mr. MARKEL. Directly.

Senator MORGAN. And as the general manager of the company?

Mr. MARKEL. Yes, sir; as president of the company.

Senator MORGAN. When the modification took place by which you consented that this contract might be rescinded at any time, that was not an arrangement between you and the board of directors, but an arrangement between you and Mr. Shonts?

Mr. MARKEL. Yes, sir.

Senator MORGAN. As general manager?

Mr. MARKEL. As president.

Senator MORGAN. As president of the railroad company?

Mr. MARKEL. Yes, sir.

Senator MORGAN. Mr. Stevens was general manager?

Mr. MARKEL. Yes, sir.

Senator MORGAN. So that the one meeting of the board that you know anything about that acted upon your relations with this railroad company was the one that you spoke of, held in New York, when the persons were present whom who have named?

Mr. MARKEL. Yes, sir.

Senator MORGAN. As directors?

Mr. MARKEL. Yes, sir.

Senator MORGAN. There was a Spanish gentleman by the name of De Ohaldia. Was he there?

Mr. MARKEL. I do not know, sir.

Senator MORGAN. He was a director?

Mr. MARKEL. I did not meet him. He may have been there.

Senator MORGAN. Do you think you have named all that were there?

Mr. MARKEL. I think so, as far as I know.

Senator TALIAFERRO. When were you first told that that contract would be canceled?

Mr. MARKEL. On the morning of October 9.

Senator TALIAFERRO. That was the date of the cancellation?

Mr. MARKEL. Yes, sir.

Senator TALIAFERRO. But you had some conversation about the cancellation before that time?

Mr. MARKEL. The only conversation had about the cancellation was, as I stated the other day, in Mr. Shonts's office, the day that I arrived in New York, September 22.

Senator TALIAFERRO. What did Mr. Shonts say to you?

Mr. MARKEL. Mr. Shonts showed me the cablegram.

Senator TALIAFERRO. What was the cablegram, and who was it from?

Mr. MARKEL. The cablegram was from John F. Stevens, chief engineer, and, as nearly as I can remember, it said that the feeding contract had created a great deal of dissatisfaction on the Isthmus; that it meant a large increase of the pay roll, and it wound up by saying that it was a well-known fact on the Isthmus that if that contract was carried out it meant a net profit to Mr. Markel of a million dollars a year.

Senator TALIAFERRO. He was right, I think. Proceed, Mr. Markel.

Mr. MARKEL. Mr. Shonts read me the cablegram and showed it to me. I said: "That is foolish. The gross receipts will not be any such amount as that. In my judgment, the gross receipts for the five years will be less than \$5,000,000." We discussed it a little while, and he said: "You come in after lunch." And he sent for Mr. Cromwell, the attorney of the railroad. I came in at the appointed time, and Mr. Cromwell was shown the cablegram, and they discussed it. Just what they said I do not remember now. Mr. Cromwell turned to me and he said: "Can this contract be modified in any way as to price? Can you furnish meals at a less price than is in that contract?" And I said: "No; under the requirements of the contract I can not do it for any less." And he said: "Mr. Shonts, I think it best that you avail yourself of your privilege that is in this contract—they had it before them—to notify Mr. Markel now that you will cancel it if you think it is best when you get to the Isthmus. You had better be prepared to do it, if you want to." Then it was that I said: "Mr. Shonts, you need not take thirty days to cancel that contract. I am willing to do whatever you think is best."

Senator TALIAFERRO. Right there, Mr. Markel, you added: "You can cancel it right now if you wish?"

Mr. MARKEL. I said: "You need not to take the thirty days. You can cancel it to suit your pleasure."

Senator TALIAFERRO. Yes.

Mr. MARKEL. Mr. Shonts said that he did not want to cancel the contract; that he was not going to cancel it there, and arranged with me to go to the Isthmus with him, leaving New York September 28. I gave them that letter which is in the evidence here, and I immediately arranged to inform my employees that I had there with me, and

I went to the Isthmus with President Shonts and my idea was that the matter would be adjusted down there. I presumed that Mr. Stevens had gotten the wrong idea of it. There had been a world of talk in the papers. The papers, of course, had gone to the Isthmus long before the contract went there, and before they knew the real contents of the contract; and in talking the contract over with Mr. Stevens on the Isthmus, it was as I thought, he did not understand the contract.

It was his idea that that contract gave me the privilege of the assignment of quarters. There was nothing in the contract about that. I had nothing to do with the quarters. He believed, and so stated, that it turned over to me the commissary, the one that was then and had been for years operated by the railroad company, and the ones that I had inaugurated for them, the subcommissaries. It was his idea that all those were turned over to me and were operated by me. Directly the opposite was the fact. I had nothing to do with the assignment of quarters nor had I anything to do with the commissaries in any shape, manner, or form. He had accepted Jackson Smith's report of the expense for the operation of the hotel. Mr. Smith had not embodied in his report all of the expenses.

Senator TALIAFERRO. As a matter of fact, Mr. Markel, was it not to your interest, from a business point of view, that that contract should have been canceled when it was, rather than that it should have gone into operation for sixty days, the time which you claim it would have taken the railroad company to cancel it, under the terms of the contract?

Mr. MARKEL. Well, Senator Taliaferro, that is a question that I could not answer. I do not know.

Senator TALIAFERRO. You stated here what your profits would have been?

Mr. MARKEL. Yes, sir.

Senator TALIAFERRO. If it had gone into operation for sixty days?

Mr. MARKEL. Yes, sir.

Senator TALIAFERRO. You stated here that your profits under the sixty days' operation would have been \$2,448.

Mr. MARKEL. I do not know just the exact figures.

Senator TALIAFERRO. You may go over them. You have them before you.

Mr. MARKEL. Your statement will suffice.

Senator TALIAFERRO. If that is so, why was it not to your interest that that contract should have been canceled at once rather than to have been put into operation for sixty days?

Mr. MARKEL. It was not canceled at once.

Senator TALIAFERRO. When was it canceled—it was canceled before it went into operation?

Mr. MARKEL. That was a matter not for them to decide. That was a matter for me. I had gone on and made a contract. I had made what I thought was a profitable, fair, and square contract. I had expected to make some money out of it. I would not have gone down there for fun. I had made all my preparations. I was there ready to put that contract in force.

Senator TALIAFERRO. That is not denied at all.

Mr. MARKEL. I had my people there. It was canceled through no fault of mine. There never has been a minute, and never had been a minute, from the time that that contract was signed up to the time it

was canceled but what I was ready to carry it out regardless of the thirty-day cancellation clause. I was there ready; I had my men on the ground; I had enough men with me to have taken charge of those two hotels at that time. I took them there with me for a purpose, and I had it arranged with my employees in New York that I could cable them and they would come on the next steamer. By the time we had taken an inventory of the property, which we would have had to do, I would have had my employees there and my material on the way.

Senator TALIAFERRO. Mr. Markel, you wish still to have the committee understand, in the face of your own statement, that the operation of this contract for thirty days would have brought you back only \$2,448, whereas you rendered a statement to the Government that your expenses up to the time you went to the Isthmus had been over \$5,700; that you would have preferred to have the contract put into operation rather than to have had it canceled when it was canceled?

Mr. MARKEL. I was willing to take a business man's chances. When I stated here the other day—

Senator TALIAFERRO. "Business man's chances," Mr. Markel, is an ambiguous term. I wish you would answer the question definitely, one way or the other. I do not know what you mean by "business man's chances." In view of your statement to this committee showing that your outside expenses in preparing to put that contract into operation had exceeded \$5,000, and remembering that under your own estimates of the operation of the contract it would have brought you in at the end of sixty days only \$2,448 of profit, I want to know whether if you would not have preferred to have the contract canceled at the time it was canceled, before it went into operation, rather than to have had it put into operation for sixty days?

Mr. MARKEL. If the contract had been put in force, it would not have been canceled in sixty days.

Senator TALIAFERRO. Your testimony shows that it could have been.

Mr. MARKEL. It could have been.

Senator TALIAFERRO. Mr. Stevens's cablegrams and conferences down there resulted in the statement to you that it would be?

Mr. MARKEL. No, sir.

Senator TALIAFERRO. I beg your pardon. Your testimony is quite clear on that point.

Mr. MARKEL. Mr. Stevens had no right to cancel the contract. He had a right to recommend.

Senator TALIAFERRO (reading from the record): "Furthermore, in the discussion we talked about the gold roll, and I said to him, 'If you will put me in the same position that you are now—not charge me for coal, not charge me anything for freight—put me in the same position that you are now—I will feed your gold-roll men at \$30 instead of \$36 a month.'"

Mr. MARKEL. Yes, sir.

Senator TALIAFERRO (continuing reading). "They discussed that a little bit; and finally Mr. Stevens and Mr. Shonts went away and we made an appointment for the next morning. I went to the office and sat around there for an hour or so, and finally Governor Magoon came out of one of the offices and said, 'Markel, we have decided to cancel that contract.' He said, 'Mr. Stevens insists that he can feed these

men for that price, and for that and other reasons we have decided to cancel it, but Chairman Shonts will tell you."

Mr. MARKEL. Yes, sir.

Senator TALIAFERRO (continuing reading). "Just then Chairman Shonts, or President Shonts, came out and he told me the same thing; and a short time after that I got a written notice that they would avail themselves of the privilege and cancel the contract."

Mr. MARKEL. Yes, sir.

(By request, the stenographer read the following question heretofore asked by Senator Taliaferro:)

"Mr. Stevens's cablegrams and conferences down there resulted in the statement to you that it would be?"

Mr. MARKEL. Mr. Stevens had no authority to cancel the contract.

Senator TALIAFERRO. I said, resulted in the statement to you that the contract would be canceled. I did not say anything about Mr. Stevens canceling it.

Mr. MARKEL. There did not anybody notify me that the contract was canceled.

Senator TALIAFERRO. What do you mean by the testimony that you gave here on Friday, then, that these men notified you that they would avail themselves of their right to cancel that contract?

Mr. MARKEL. They did, on October 9.

Senator TALIAFERRO. Why do you say here now that you were not given that notice?

Mr. MARKEL. I was not given that notice in New York.

Senator TALIAFERRO. I am not talking about New York.

Mr. MARKEL. When I gave them that privilege, to cancel the contract immediately and not avail themselves of the 30-day clause—

Senator TALIAFERRO. You know very well, Mr. Markel, when I distinctly said that after the cablegrams and conferences with Mr. Stevens you were notified that the contract would be canceled that I had no reference to New York. I knew that Mr. Stevens was on the Isthmus just as you knew it. How could you have a conference with Mr. Stevens in New York when you were down on the Isthmus?

Mr. MARKEL. I could not.

Senator TALIAFERRO. Why, then, do you insist that I was referring to New York?

Mr. MARKEL. You seem to be referring to my notice of the cancellation of the contract.

Senator TALIAFERRO. That is what I do refer to.

Mr. MARKEL. The point that I am trying to make is that I never was notified that they would or intended to cancel that contract until the morning of October 9, on the Isthmus. That is the point I am trying to make clear.

Senator TALIAFERRO. It had been suggested, but you had never received positive notice that it would be canceled?

Mr. MARKEL. No, sir.

Senator TALIAFERRO. It had been suggested?

Mr. MARKEL. No, sir. Talking it over with Mr. Shonts he said: "Now, we will go to the Isthmus and we will see what is the matter. I am not satisfied that this is the best thing to do. There may have something developed down there that I do not know anything about."

Senator TALIAFERRO. Did you not testify here a few moments ago that Mr. Cromwell said to Mr. Shonts in your presence, "Shonts, you

had better give Mr. Markel notice and avail yourself of this privilege, so that you can go down there prepared to cancel that contract?"

Mr. MARKEL. That was the thirty-day notice.

Senator TALIAFERRO. That was in New York?

Mr. MARKEL. That was in New York.

Senator TALIAFERRO. And still you say that you had no suggestion that the contract would be canceled?

Mr. MARKEL. No, sir.

Senator TALIAFERRO. You did not regard that as a suggestion?

Mr. MARKEL. The suggestion was that they wanted to put themselves in a position to cancel it, without taking thirty days to do it. That was my understanding of it.

Senator TALIAFERRO. Just the contrary is mine.

Mr. MARKEL. I can not help what yours is, Senator.

Senator TALIAFERRO. Mine is just the contrary. When you say, Mr. Markel, that the attorney for the railroad company said to the general manager of the railroad company, in your presence, "I think, Shonts, you had better arrange this thing so that you can go there prepared to cancel this contract under the provisions in the contract authorizing you to do it"—that it is a definite suggestion that the contract was going to be canceled when you got to the Isthmus, and especially as Mr. Stevens had cabled up here that he thought it ought to be canceled, and you were going there to consult him about it.

Have you met Mr. Shonts since you have been in Washington?

Mr. MARKEL. Yes, sir.

Senator TALIAFERRO. This time?

Mr. MARKEL. Yes, sir.

Senator TALIAFERRO. Have you discussed with him your testimony before this committee?

Mr. MARKEL. No, sir.

Senator TALIAFERRO. Not at all?

Mr. MARKEL. No; I think—yes; I met him yesterday. I was up to his house and called on him, and I discussed what I had said here.

Senator TALIAFERRO. Just in a general way?

Mr. MARKEL. Yes, sir.

Senator TALIAFERRO. Did you meet Mr. Cromwell?

Mr. MARKEL. Yes, sir.

Senator TALIAFERRO. Did you discuss it with him?

Mr. MARKEL. Yes, sir.

Senator TALIAFERRO. Did Mr. Cromwell see your testimony before you delivered it here on Friday?

Mr. MARKEL. No, sir.

Senator TALIAFERRO. He did not see the manuscript of your testimony?

Mr. MARKEL. No, sir.

Senator TALIAFERRO. What discussion did you have with Mr. Cromwell about your testimony here?

Mr. MARKEL. A few minutes, standing in the rotunda of the New Willard Hotel.

Senator TALIAFERRO. You testified here Friday?

Mr. MARKEL. Yes, sir.

Senator TALIAFERRO. Did you see Mr. Cromwell Friday night?

Mr. MARKEL. I do not think so. I might have seen him.

Senator TALIAFERRO. Did you make an effort to see him?

Mr. MARKEL. No, not specially. I think I met him; I do not think I have been in the Willard Hotel any day since I have been here but what I have seen Mr. Cromwell.

Senator MORGAN. You did not go to church Sunday?

Mr. MARKEL. No, sir; I was nursing a cold, Senator.

Senator TALIAFERRO. When you gave this testimony to Secretary Taft had you any idea of the questions he was going to ask you?

Mr. MARKEL. No, sir.

Senator TALIAFERRO. None at all?

Mr. MARKEL. No, sir.

Senator TALIAFERRO. Mr. Chairman, I wish to say before proceeding with this witness that I received from the Commission a protest in the form of an affidavit and an explanation of the letting of this contract to Mr. Markel. Accompanying those papers was a statement of the bid made by Hudgins & Dumas for this work. It is all in the record and comes to me from the Commission through you.

I wish to add that I do not know Messrs. Hudgins & Dumas, or either one of them. I have never heard from them, one way or another. I simply desire to ascertain, if possible, how this contract came to be let to Mr. Markel when, under his statement of the operation of the contract, it shows that he was to receive a much larger amount than Hudgins & Dumas offered to do the work for. I would like to ask the committee if they are willing to consider this paper that comes to us from the Commission as a definite copy of the bid that Hudgins & Dumas gave the railroad company in New York at the time these bids were being asked; that is, whether the committee is willing to admit that that is the bid they rendered.

Senator KITTREDGE. I have no doubt of that.

The CHAIRMAN. That appears in the record, as I understand it?

Senator TALIAFERRO. Yes; it is in the record before me now.

Mr. Markel, according to your exhibit of earnings under your contract, if it had gone into operation for the first year you estimate: Gold roll, two hotels, 150 men each, 300 men, at \$36 a month, \$129,600; silver roll, 1,000 men, \$145,000; showing a net profit of \$14,688.

I wish to introduce in evidence this statement which has been prepared by my clerk, under the bid of Hudgins & Dumas, with the statement that I have not personally gone over the figures to test their accuracy, showing that on precisely the same basis as your exhibit to the committee, the bid of Hudgins & Dumas for the 300 gold men would be \$126,000, and for the 1,000 silver men \$108,000—that is, \$108,000 against your \$144,000, and \$126,000 against your \$129,600—showing that on those two items Hudgins & Dumas's bid for the first year of the operation of the contract as estimated by you would be \$39,600 less than your bid; and for the operation of the contract, according to your estimate and on the basis of your estimate for the first five years, there would be a difference of \$691,200. In other words, Hudgins & Dumas offered to do this work for that much less than the railroad company contracted with you to do it for.

Do you wish to go over those figures?

(The statement above referred to by Senator Taliaferro was afterwards withdrawn.)^a

Mr. MARKEL. I do not know; you have given the figures. I would like to know what their bid was. I have never seen their bid.

Senator TALIAFERRO. It is in the record.

^aSee page 1399.

Mr. MARKEL. I have never seen it. What is their bid for the gold roll? How much per month?

Senator TALIAFERRO. Thirty-five dollars. Will you explain to the committee, if you can, how it was that the railroad people gave you this contract, with a bid as much lower as Hudgins & Dumas right before them? Do you know any reason?

Mr. MARKEL. No, sir; I do not. That is something that will have to be explained by people who know about it. I do not know anything about it. I do not know what their bid was.

Senator TALIAFERRO. Mr. Shonts, on page 372 of his examination, in response to an inquiry by Senator Simmons, stated that there are now employed on the Isthmus about 17,000 people, and that of these 2,500 are on the gold roll, which would leave 14,500 on the silver roll. If that statement of Mr. Shonts's is accurate, and those men had come under the operation of your contract, the difference between your bid and Hudgins & Dumas's for the first year would be \$552,000 in favor of the Hudgins & Dumas bid.

Mr. MARKEL. Well, are you prepared to say that all those people would avail themselves of the hotels and other accommodations?

(By request, the stenographer repeated the last question.)

Mr. MARKEL. I will see if I understand the question. That assumes that all of that 17,500 would either live at the hotels or at the camps. Is that what you mean?

Senator TALIAFERRO. I do not assume it. I said if those men should come under the operation of your contract that would be the result. Let us go a step further. On page 271 Mr. Shonts estimates that by next July the number of white employees will be from 3,200 to 3,500 and that the number of negroes will be from 20,000 to 23,000 or 24,000. Taking, now, the number of 3,200 of gold men, the lowest that Mr. Shonts suggests, and 20,000 silver men, if this number came under the operation of your contract the difference between your bid and Hudgins & Dumas' would be \$758,400 a year, or in the five years that you have estimated \$3,792,000, that the railroad company contracted to pay you in excess of what a reputable and experienced man in your line of business offered to do the work for. Can you imagine why the railroad people felt such a decided partiality and preference for you as to subject those workmen on the Isthmus to the cost of \$3,792,000 every five years in order to give you this contract?

Mr. MARKEL. In the first place, Senator, if there were 3,200 of the white employees—I do not know how many there were—but if there were, a large proportion of those employees—

Senator TALIAFERRO. What proportion, now?

Mr. MARKEL. Well, when I was on the Isthmus, in October, there were 300 men living at the hotels. How many did he say were there at that time?

Senator TALIAFERRO. I have not looked that up. I will get you to look it up, Mr. Markel.

Mr. MARKEL. There were 300 men living in the hotels at the time we were there, in October. The balance of them were keeping house, "baching," or living elsewhere—living in the cottages, in the hotels, and boarding houses.

Senator TALIAFERRO. I want to be perfectly fair about this, Mr. Markel, and I simply desire to get at the facts. Of those 3,200 white people that Mr. Shonts says he thinks will be on the Isthmus by July,

how many do you think would come under the operation of your contract if it were in force on the Isthmus?

Mr. MARKEL. I considered, in making up my figures, that at the beginning of the third year we would have six hotels in operation, and at each one of those hotels there would be 150 guests; that would be 900.

Senator TALIAFERRO. Did you think, then, that there would be as many men on the Isthmus as Mr. Shonts estimated?

Mr. MARKEL. Yes, sir; I knew what there was on the Isthmus.

Senator TALIAFERRO. And you thought that out of 3,200 white men only 900 would come under the operation of your contract?

Mr. MARKEL. Yes, sir; and I think you will find that that will be the outside. Experience has shown down there that they never had more than 1,000 negroes or Jamaicans that they were boarding at any one time out of the 17,000 or 15,000, or whatever there was there. A great many of those people, both the white and the colored, have got their families with them, and many more of them make up a mess and get their supplies from the commissary and live in that way. In my judgment there would not have been more than a quarter of the white people that would avail themselves of the hotels, and as to the colored people there is no knowing; no man can guess that. I would say simply guess. The statement that I made up there is a guess.

Senator TALIAFERRO. I understood that.

Mr. MARKEL. I have not anything to make me believe that that is so. It is simply a guess. I had to have a guess or a unit to figure from. In the hotel business to have a certain number of people in a hotel is profitable; to have more people is more profitable; to have less is a loss. I have no way of knowing whether I would have had 900 men or more or less.

Senator TALIAFERRO. Under your modest estimate of the number of people on the Isthmus that would come under the operation of your contract if it were in force, the difference even then in five years would be \$691,200 that the railroad company agreed to pay you in excess of a bid from reputable and experienced people who offered to do the work. You know these people, Hudgins & Dumas?

Mr. MARKEL. No, sir.

Senator TALIAFERRO. Do you know of them?

Mr. MARKEL. No, sir.

Senator TALIAFERRO. Well, just for your information I will tell you who they refer to, Mr. Markel [reading]:

"AUGUST 23, 1905.

"Hon. THEODORE P. SHONTS,

"Chairman Isthmian Canal Commission,

"Washington, D. C.

"DEAR SIR: Believing that the time is near at hand when definite arrangements will be made for the conduct of the commissary in conjunction with the construction of the Panama Canal, we desire to confer with you on this subject at a time and place to be appointed by you.

"For the three years ended July 1 last we were the official commissaries at the Ellis Island immigrant station, where we served at times as many as 20,000 meals a day, the food being such as the various nationalities of immigrants were accustomed to at home. We have numerous

testimonials of the efficiency of our administration there from officials and others, which we shall be pleased to submit to you. These include a strong indorsement from the trans-Atlantic steamship companies, which pay the cost of maintenance of detained immigrants.

"The President is thoroughly familiar with our work at Ellis Island, and we feel at liberty to refer you to him as to our capabilities, also to the Hon. George B. Cortelyou, who, as Secretary of Commerce and Labor, made a careful study of the problem; to the Hon. William Williams, now of No. 35 Wall street, New York, who, as commissioner of immigration, was our immediate superior, and to the Hon. Robert Watchorn, the present commissioner at Ellis Island.

"For conducting business in Panama we have a valuable experience, ample capital, and the command at short notice of capable assistants, including natives of the West Indies and men of various other nationalities. All we need is to know what the requirements are, and we assure you that we can be depended upon to meet promptly and satisfactorily any reasonable commissary situation.

"Will you not give us an opportunity to ascertain your views upon the pending problem with the object of assisting you and broadening the scope of our activities?

"Respectfully,

HUDGINS & DUMAS."

If they were authorized to refer, as they did, to those people, it would seem that they were pretty good men. Would you not say so?

Mr. MARKEL. It would seem that they were after political influence, anyway.

Senator TALIAFERRO. Do you think it seems that a man is after political influence when he refers to the President of the United States as to his reliability and responsibility?

Mr. MARKEL. Well, you asked my opinion. That is my opinion. It seems as though, if they were so brilliant—well, I do not know anything about it. I do not know the men at all. I do know that they have not the contract at Ellis Island now and that they lost it.

Senator TALIAFERRO. You do not mean, Mr. Markel, that a man bidding on a contract like this would dare attempt to pull the President of the United States into it for political advantage.

Mr. MARKEL. I mean to say that I would not.

Senator TALIAFERRO. Then why do you think others would?

Mr. MARKEL. You asked me my opinion.

Senator TALIAFERRO. If you would not, why do you think others would?

Mr. MARKEL. You asked my opinion, and then referred to those gentlemen. I was asked here Friday what political influence helped me. I testified, absolutely none.

Senator TALIAFERRO. If your testimony had stopped there, it would have been better for you.

Mr. MARKEL. I think it will average up all right.

Senator TALIAFERRO. I am satisfied with it, Mr. Markel.

Mr. MARKEL. So am I.

Senator TALIAFERRO. I would like to ask you, Mr. Markel, if you do not wish to correct your testimony here where you stated to Mr. Kittredge that those laboring men down there were fed like hogs, the only difference being their food was passed out on a tin plate, where

hogs were fed in a trough. Do you remember testifying about that?

Mr. MARKEL. Yes, sir.

Senator TALIAFERRO. Do you still desire to leave that in your statement?

Mr. MARKEL. I have no desire to change my testimony in that respect. I did say, though, at the same time that they were perfectly satisfied and happy and contented.

Senator KNOX. Who—the hogs or the men?

Mr. MARKEL. Both.

Senator TALIAFERRO. And you thought it was as good as they deserved?

Mr. MARKEL. No; I did not think so.

Senator TALIAFERRO. Did you not say that?

Mr. MARKEL. No, sir; I do not think so. I thought that they were satisfied with it, and it is always good to let well enough alone.

Senator TALIAFERRO. In your testimony before Secretary Taft, on page 375, this statement appears:

“The facts were they were feeding those negroes just as well as they deserved and well enough for them for 30 cents a day, but were doing it a little bit different and furnishing a different menu from what the contract called for.”

Mr. MARKEL. Yes, sir.

Senator TALIAFERRO. So you were mistaken in stating that you had not said that—that it was as good as they deserved?

Mr. MARKEL. I was testifying as to what I said Friday.

Senator TALIAFERRO. You did say it at a different time?

Mr. MARKEL. To Secretary Taft I said it was as good as they deserved for 30 cents a day. That is what I said.

Senator TALIAFERRO. “Just as well as they deserved and well enough for them for 30 cents a day.”

Mr. MARKEL. That is it. Now I do not know how I could make my statement any plainer than that, Senator. That is what I meant—just what I said.

Senator TALIAFERRO. You mean now, then, that they deserved better, but that was as good as could be furnished them for 30 cents a day?

Mr. MARKEL. Yes, sir.

Senator TALIAFERRO. They deserved better?

Mr. MARKEL. Yes, sir; I think they did.

Senator TALIAFERRO. Then you did not mean to tell the Secretary of War that they were fed as well as they deserved?

Mr. MARKEL. I meant to tell the Secretary of War that they were fed as well as they deserved for 30 cents a day. That is what I said, was it not, Senator?

Senator TALIAFERRO. That appears to be what you do say.

Mr. MARKEL. Well, that is what I said then, I believe.

Senator TALIAFERRO. You stated on Friday, somewhere in this testimony—I do not seem to be able to put my hand on it—that you were told that there were disquieting telegrams from the Isthmus, and that it was due to that circumstance that Mr. Shonts spoke of canceling that contract, or due to that circumstance in part. Do you recall that?

Mr. MARKEL. Yes, sir.

Senator TALIAFERRO. That is a fact?

Mr. MARKEL. Would you like me to refer to that?

Senator TALIAFERRO. I am perfectly willing that you should, Mr. Markel.

Mr. MARKEL. It is in there somewhere.

Senator TALIAFERRO. I do not see where it is.

Mr. MARKEL (After examining record). I think you will find it on page 1289.

Senator TALIAFERRO. You can read it, Mr. Markel.

Mr. MARKEL. Here is my reply. I said: "No, sir; the reason why I consented —"

Senator TALIAFERRO. Read the question, please, Mr. Markel.

Mr. MARKEL. Oh, I beg your pardon (reading).

"Senator TALIAFERRO. The minutes of the meeting of the board of Directors of the Panama Railway Company on November 8, 1905, state that—

"After considering all the aspects of the case with Mr. Markel, the latter had agreed to the cancellation of the contract previous to its becoming effective, and without any obligation on the part of the company to reimburse him either for his services or his actual expenses, which latter amounted to \$5,745.97."

You said:

"Is that a true statement of the understanding under which you consented to the cancellation of your contract?"

I said:

"No, sir; the reason why I consented to the cancellation of the contract was because of the disquieting telegrams from the Isthmus, for the reason that it would be impossible for me or any other contractor to carry out the contract if he had the general manager of the railroad on his neck and his assistants cutting his bowels out."

I will admit that it was very impolite language, but it is the fact, just the same.

Senator TALIAFERRO. Were there any other reasons besides those you assigned? I suppose this "disquieting telegram" or cablegram was from Mr. Stevens?

Mr. MARKEL. Yes, sir; yes, sir.

Senator TALIAFERRO. Were there any other reasons?

Mr. MARKEL. That I gave that consent?

Senator TALIAFERRO. Yes.

Mr. MARKEL. Because Mr. Shonts asked me for it; that is, Mr. Shonts in connection with Mr. Cromwell. My understanding of it was that they wanted to go to the Isthmus—

Senator TALIAFERRO. Had you not said that the newspapers had something to do with it?

Mr. MARKEL. I said there was a great deal of noise in the newspapers about a \$50,000,000 graft and it was published all over the whole country and in Europe.

Senator TALIAFERRO. Where did you say that?

Mr. MARKEL. I do not know that I said it, but I say that I do know that that was a fact.

Senator TALIAFERRO. Did you not assign in your testimony before Secretary Taft as one of the leading reasons the stir that the newspapers were kicking up over your contract and the way it was treated down there on the Isthmus?

Mr. MARKEL. Well, Secretary Taft, if I remember right, asked me what I supposed caused the trouble, and I said I was of opinion—I do not know that I can repeat the exact language—

Senator TALIAFERRO. I was trying to find it. I would give you the benefit of it if I could find it.

Mr. MARKEL. But my idea was to convey to him that these newspapers had gone to the Isthmus before the contract reached there; the newspapers had all kinds of misstatements, statements of all kinds, and that the gentlemen on the Isthmus got their views from the newspapers rather than from the contract; and I think I stated here to-day that that opinion was confirmed when we got to the Isthmus, that Mr. Stevens was misinformed as far as the contract was concerned, and had a wrong idea of it.

Senator TALIAFERRO. I do not think I care to ask any more questions now, Mr. Chairman.

The CHAIRMAN. Senator Taliaferro, are you through with Mr. Markel? As I understand, he is very desirous of getting away on a train that leaves, I think, about 5 o'clock, and if you are through we will let him go; if not, we will hold him here.

Senator TALIAFERRO. I shall be through with him very shortly. I want to ask him one question that has just occurred to me.

Mr. Markel, you had an office, I think you said, in New York?

Mr. MARKEL. Yes, sir. I rented it the day I signed the contract.

Senator TALIAFERRO. You did not rent it before you signed the contract?

Mr. MARKEL. No, sir; the day that I signed the contract. I had negotiated for it, and had the arrangements all made.

Senator TALIAFERRO. Did you furnish it?

Mr. MARKEL. Yes, sir; I put in a table and a couple of chairs—that was all.

Senator TALIAFERRO. You said they were included in the expenses?

Mr. MARKEL. Yes, sir; and the railroad company have them now in New York.

Senator TALIAFERRO. You turned them over to the railroad?

Mr. MARKEL. Yes; they have them in use in New York—in their office.

Senator TALIAFERRO. About that charter: When you attempted to charter the company, to transfer your contract to a company, did I understand you to testify here that there was no cost to the Government on account of the creation of that charter, the getting it out in any way?

Mr. MARKEL. I do not think there was.

Senator TALIAFERRO. But do you not know?

Mr. MARKEL. No; I do not just call to mind now.

Senator TALIAFERRO. Do you not know whether you would charge the United States Government for forming a corporation of your own?

Mr. MARKEL. I hardly think I would.

Senator TALIAFERRO. Well, now, I propose that you reflect until you answer that question. I ask the question; I repeat the question.

(By direction of Senator Taliaferro, the stenographer read aloud the pending question as follows:)

“When you attempted to charter the company to transfer your contract to a company, did I understand you to testify here that there

was no cost to the Government on account of the creation of that charter, the getting it out in any way?"

Mr. MARKEL. No, sir; I could not say. I think not. There was no cost unless it was the filing fee at Pierre, which was just a few dollars.

Senator TALIAFERRO. Do you wish to correct your testimony here where you stated, on Friday, positively, that there was no cost to the Government?

Mr. MARKEL. If I testified to it positively, no; I do not want to change it.

Senator TALIAFERRO. Let us go back and see if you did, then, Mr. Markel. I do not want to do you any injustice about it.

Mr. MARKEL. There is an expense charged in there, I think, Senator, for the cancellation of my bond. You understand that I filed a bond of \$100,000?

Senator TALIAFERRO. I do not refer to that.

Mr. MARKEL. That cost me a little something.

Senator MORGAN. A bond of security?

Mr. MARKEL. Yes, sir; a security bond.

Senator MORGAN. To whom was that payable?

Mr. MARKEL. To the railroad company.

Senator MORGAN. The Panama Railroad Company?

Mr. MARKEL. Yes, sir.

Senator MORGAN. What has been done with that?

Mr. MARKEL. I got it canceled.

Senator MORGAN. Canceled?

Mr. MARKEL. Yes, sir.

Senator MORGAN. By whose order?

Mr. MARKEL. By my order, after the contract was canceled, Senator.

Senator MORGAN. At your request; but was there any cancellation written on the paper?

Mr. MARKEL. No, sir; I just simply returned the bond to the home office.

Senator MORGAN. Oh, yes. You got your insurance from a corporation.

Mr. MARKEL. I got my insurance from a corporation, a guaranty company.

Senator MORGAN. And you returned it to them?

Mr. MARKEL. I returned it to them. It cost me——

Senator MORGAN. It was not actually canceled, then, but returned?

Mr. MARKEL. Yes; just mailed to them.

Senator TALIAFERRO (reading from page 1285 of the record). "I suppose all the expenses of that incorporation were borne by you?" "Yes, sir." "It cost the Government nothing?" "No, sir."

Who was your attorney in that matter?

Mr. MARKEL. Mr. Frank P. Leffingwell, of Chicago.

Senator TALIAFERRO. How much of the stock was ever issued?

Mr. MARKEL. Just what Mr. Wadleigh and I subscribed for, and one share to Mr. P. J. Partenaver, who was my chief clerk in the United States, and my brother-in-law.

Senator TALIAFERRO. Did you pay in the amount of your subscription to the stock in money?

Mr. MARKEL. Yes, sir.

Senator MORGAN. Why, certainly; that is all right.

Senator KNOX. So that it would read, "examined later at the request of any member of the committee?"

Senator MORGAN. Yes.

Senator KNOX. I make that motion, Mr. Chairman.

Senator KITTREDGE. I have no objection to it. I accept the amendment.

Senator MORGAN. I have been allowing the questions that Mr. Cromwell refused to answer to go over without the action of the committee, because I wanted to place him in connection with various and sundry acts which I considered to be important transactions, which in my judgment are not at all protected by any professional confidences, nor could they be, especially by one who is a prominent officer of the United States Government to-day as attorney for the Panama Railroad Company.

The CHAIRMAN. Senator Morgan, do I understand that the letter and the papers which I handed you there from Mr. Cromwell you expect to go in the record?

Senator MORGAN. Yes, sir; I want these to go in the record, together with the letter of transmittal.

(The committee thereupon adjourned until to-morrow, Tuesday, March 6, 1906, at 10.30 o'clock a. m.)

(The papers above referred to are as follows. By direction of the committee they will be printed in the permanent record of the committee's proceedings, in connection with Mr. Cromwell's testimony.)

WASHINGTON, D. C., *March 3, 1906.*

Hon. J. H. MILLARD,

Chairman, United States Senate, Washington, D. C.

DEAR SIR: During the course of my examination I was requested by the committee to produce three papers to be printed as a part of the record, and I accordingly do so.

1. Full copy of letter of Mr. Wallace to Mr. Shonts dated June 26, 1905.

2. The published statements of Secretary Taft as appearing in the Washington Post of June 30, 1905.

3. Transcript of the stock ledger of the Panama Railroad under the heading "William Nelson Cromwell," being a record of the few shares of that company which have at any time been held by Mr. Cromwell.

Yours, very truly,

WM. NELSON CROMWELL.

[Personal and confidential.]

ISTHMIAN CANAL COMMISSION,
New York, June 26, 1905.

Mr. T. P. SHONTS,

*Chairman Isthmian Canal Commission,
Manhattan Hotel, New York City.*

MY DEAR MR. SHONTS: When I arrived in New York Thursday night I was told that you had left the city for Chicago and would not be back until the first of this week. I see by the papers this morn-

ing, however, that you were either in the background at the Manhattan yesterday, or else came around the corner after I left the conference.

For various reasons my interview with the Secretary seemed very unsatisfactory, at least to him, and resulted in my informing him that I would forward my resignation as chief engineer and Commissioner to the President through him to-day, subject to acceptance at the convenience and pleasure of the President, of course with the understanding that this meant the near future if not immediately.

The business proposition that I have now under consideration is of such an important character, and opens out such a wide field for future prosperity to me, that I can not possibly see how I would be justified in declining it. My family and those of my friends with whom I have consulted with regard to it have been absolutely a unit in urging me to form the new connection.

There were so many sides to this matter that I thought it best for the Secretary of War and myself to discuss it in all its features and at length. I also did not feel that it would be fair to the Secretary to let the matter lie over until after he had left the country.

On the other hand, the situation was such that I would have had to let the opportunity go by if it had become necessary to postpone it until his return from the Philippines.

It is my desire, of course, to leave everything connected with the work in satisfactory shape, and I will do everything possible to assist you and the Secretary in arranging matters. At no time in the future could the change be made more advantageously than now, as the organization is all blocked out and in working order, and can be strengthened and expanded either slowly or rapidly as may be desired, and in case arrangements are made that will put my counsel and advice at your command during the next few months, there is no reason why the change should cause any particular delay or annoyance.

I have no other wish or desire than to bring about the change with the least annoyance and inconvenience to the Administration and yourself, and do not feel that I can be justly subjected to any criticism on account thereof, particularly as I have offered to give as much of my time in a consulting and advisory capacity as may be considered desirable, although you can readily understand that I would much prefer to have no further connection with the work, in order that my entire time can be given to my personal and business matters.

I write you this fully and confidentially, not as chief engineer of the Commission, but as a personal friend and associate in this work, and would, of course, be pleased to have a conference with you wherever and whenever you desire, although I have personally kept away from public places as I did not care to come in contact with representatives of the press until after all matters had been finally adjusted and my connection with the work terminated, as it seemed to me best for the interests of all that absolutely nothing should be given to the public press beyond the mere fact that I had resigned for personal and family reasons in order to form business connections which I felt in justice to myself and family I could not decline.

As I said before, I am afraid the Secretary did not appreciate the fact that while I was determined to sever my connection I desired to leave my relations friendly and to do everything possible to prevent

any embarrassment to the Administration or delay and injury to the work.

I desire to express to you my warm personal regard and my thanks for the kind and generous way in which you have treated me in all matters connected with the work, and to assure you that your personality had nothing whatever to do with the step that I am taking; in fact, in considering the questions from both sides one of the strong inducements for me to remain was your pleasant personality and our warm personal friendship.

On the other hand, the probability of your being disconnected with this work, either in the near or immediate future, which seemed to come to me intuitively, and the probability of the position being filled by some man with whom I could not harmoniously act, was one of the strong inducements that controlled me.

As I have reported my presence in New York to the Secretary formally, and he understands the line of action which I will pursue, I will, of course, remain here until I receive further advice.

With kindest regards, I remain,

Very truly, yours,

JOHN F. WALLACE.

Account Wm. Nelson Cromwell.

[Transcript of stock ledger, Panama Railroad Company.]

DR. 1893.	Shares.	CR. 1893.	Shares.
Dec. 18. To Edward L. Oppenheim.	11	Mar. 30. By Xavier Boyard.....	1
Apr. 17. To Henry Boudet	1	31. By J. F. McLoughlin	14
1897.		1897.	
Apr. 3. To C. B. Comstock.....	1	Apr. 6. By Henrietta Martin.....	29
1904.		1904.	
Feb. 20. To J. G. Buchanan.....	1	July 14. By Charles Paine.....	1
To George Whaley.....	1	Oct. 26. By J. G. Walker, chairman	
July 13. To J. G. Walker	1	Isthmian Canal Commis-	
To Wm. H. Burr.....	1	sion	7
To Carl Ewald Grunsky... 1			
Sept. 15. To Wm. Barclay Parsons.. 1			
Oct. 25. To Geo. W. Davis..... 1			
To Benj. M. Harrod..... 1			
To Frank J. Hecker..... 1			
1905.			
Mar. 9. To Wm. H. Taft, Secretary			
of War	29		
Jan. 25. To Wm. Nelson Cromwell.	1		
Total	52	Total	52

SECRETARY TAFT'S STATEMENT REGARDING MR. JOHN F. WALLACE.

[As printed in the Washington Post on June 30, 1905.]

Why Wallace quit—Gave up Panama work for a better-paying job—Scored by the Secretary—Accused of bad faith and utter disregard of obligations—The facts leading up to the withdrawal of the chief engineer from the Panama Canal work is set forth by the Secretary, but shows no evidence of friction between Wallace and his associates—Pointed interview in New York.

Chief Engineer John F. Wallace retires to private pursuits with as severe a castigation as has fallen upon any high official in modern times. He did not quit, it now appears, because of red tape. "Mere lucre" was his sole incentive, according to the official view. There was no friction with his associates. In every particular he was accorded the greatest possible freedom in executing the great Isthmian project.

His discomfiture is described as great when, at the recent conference in New York Secretary Taft met him face to face and characterized his conduct as anything but honorable. His humiliation must now be all the greater that practically the full text of the colloquy is made public in the statement Secretary Taft issued last evening. In almost every particular this statement was a surprise, as it presented the situation in quite a different light than had hitherto been indicated. A big holding company in New York lured the chief engineer away by a tempting offer. He yielded almost immediately when the offer had been increased from \$40,000 to over \$60,000. When all the facts had been presented the Secretary demanded the chief engineer's resignation. Even if any persuasion to remain in the Government service would avail, Secretary Taft declared that his confidence in Mr. Wallace was permanently shaken. He could not tolerate one so lost to sense of obligation. Therefore, Mr. Wallace was virtually dismissed.

YIELDED TO ALL HIS REQUESTS.

The correspondence preliminary to the appointment of Mr. Wallace on the Commission is given in successive steps. The readiness of the Government to comply with his requests is shown. Then comes the details of Mr. Wallace's sudden decision to resign and the conversation that passed at the New York conference. The Secretary, Mr. Wallace, and William Nelson Cromwell, the Government's counselor, were present. Notes of the conversation were taken. This conversation is reproduced, in the main, in the Secretary's statement. Mr. Wallace is accused of deserting the Government at a crucial moment, when he was bound by every consideration of honor to continue his services.

The chief engineer is placed in an unenviable light. He is shown to have sought his position, which, as Secretary Taft asserts, made him known as an engineer of eminence the world over. Secretary Taft spent most of yesterday putting the statement in shape. There were many consultations over it, in which Chairman Shonts and Attorney Cromwell figured. It was expected that a successor to Mr. Wallace could be appointed last evening. Efforts were made to communicate with some man, whose name is not made public, but who was expected to arrive in Chicago last evening.

SECRETARY TAFT'S STATEMENT.

The text of the statement follows:

"Mr. John F. Wallace was on May 5, 1904, appointed chief engineer of the Isthmian Canal, under action of the Commission, as follows:

"The Commission reconvened and the chairman reported that he had had a conference with Mr. Wallace, who had declared himself ready to accept the position of chief engineer at a salary of \$25,000 per year and a residence on the Isthmus, and had stated that he would be prepared to enter upon the duties of chief engineer on June 1."

"Reorganization of the then Isthmian Canal Commission being under consideration, Mr. Wallace wrote the Secretary of War on December 20, 1904, as follows:

"If you will kindly pardon me for doing so, I would like to make the personal suggestion that if the President and yourself should decide at any time to reduce the Commission to three members, resident on the Isthmus, the governor of the Zone and the chief engineer should be members of this Commission ex officio.

"An organization of this kind, with the chairman of the Commission resident in Washington to look after general and departmental matters, would no doubt work satisfactorily and be much less cumbersome than the present one."

"And again on March 15, 1905, he wrote the Secretary:

"I hope you will not consider me presumptive if I respectfully ask that I be granted a personal interview before any radical change is decided upon in the governmental organization which would affect me unfavorably. I am not requesting additional emolument of any nature whatever, but simply that no condition of affairs be created which will unnecessarily interfere with my efficiency here."

"On March 24, 1905, the Secretary submitted to Mr. Wallace in detail, by cable, the plan of reorganization which the President proposed to make (substantially as embodied in the subsequent Executive order of April 1), and on the following day Mr. Wallace cabled the Secretary as follows:

"Plan excellent. Satisfactory. Gracias (thanks)."

DUTIES OF THE NEW COMMISSION.

"Thereafter the President issued his Executive order of April 1, creating a new Commission and defining their duties, among other things that of the chief engineer, as follows:

"The head of the third department shall be the chief engineer. He shall have full charge on the Isthmus: 1. Of all the actual work of constructions carried on by

the Commission on the Isthmus. 2. The custody of all the supplies and plant of the Commission upon the Isthmus other than all supplies needed for sanitary purposes. 3. The practical operation of the railroad on the Isthmus, with the special view to its utilization in canal construction work. 4. He shall reside on the Isthmus and devote his entire time to the service, except when granted leave of absence by the Secretary of War.'

"Mr. Wallace expressed his unequivocal approval of the distribution of duties and powers as above defined by the Executive order, especially those relating to the office of chief engineer, and during his subsequent stay of six weeks in the United States daily participated with his associates in carrying out the same. To the President, Secretary of War, members of the Commission, and its counsel he frequently expressed his unqualified approval and acceptance of the distribution of duties and powers as in the order embodied, and particularly those relating to himself, which required the performance by him of the duties of constructive engineer upon the Isthmus.

"Mr. Wallace sailed for the Isthmus on May 17, accompanied by his family, and as late as May 26 wrote Mr. Cromwell from the Isthmus as follows:

"In looking back over the events of the last few months I become more and more impressed with the wisdom underlying the action of the President and the Secretary of War, * * * and the manner in which matters have been guided over the troubled waters of the sea of complication which has surrounded the situation.'

"He reached the Isthmus May 24, but within twelve days thereafter cabled the Secretary of War as follows:

CABLED FOR LEAVE TO RETURN.

"PANAMA, June 5, 1905.

"SECRETARY OF WAR, Washington:

"Important complicated business matters which can not be arranged by correspondence, and which may affect my relations as chief engineer of Commission, necessitate immediate return to the United States to confer with you and others. An order from you to return for official consultation will prevent apprehension on the part of employees. Suggest Shonts remain until my arrival. Please answer.

"WALLACE.'

"To this, reply was sent the following day as follows:

"Secretary of War and Shonts, in accordance with your request and without knowledge of circumstances that justify, approve your return for consultation with them at Washington.'

"By letter of June 4, addressed to the Secretary of War, Mr. Wallace states:

"Certain complications are arising in my personal affairs which may render it necessary for me to go to the States on receipt of a cablegram at any time. Will you kindly cable me permission to do so? It is needless for me to say that I will not do this unless I consider it absolutely necessary.'

"On June 8, a few days before he sailed for New York, Mr. Wallace wrote the Secretary of War a letter, in which he referred to his intended visit to the United States, but gave no explanation of his personal plans.

"Mr. Wallace arrived at New York the evening of the 22d instant, and the Secretary made appointment for a conference on Sunday morning, the 25th instant, at the Manhattan Hotel, in New York City, the Secretary being then en route to New Haven and Boston.

"The conference took place at the Manhattan Hotel as arranged. There were present the Secretary of War, Mr. Wallace, and Mr. Cromwell, who for some time had been charged by the President and Secretary with general advisory duties in all Panama Canal affairs.

THINGS PERSONAL TO HIMSELF.

"Mr. Wallace stated that part of the interview would be personal to himself and part would concern the general canal work on the Isthmus. The Secretary referred to the foregoing cables and acquiesced in Mr. Wallace's suggestion that he first speak of the personal matters.

"Mr. Wallace then said that a few days before he sent the above cable to the Secretary he had received a cable from prominent business men in New York asking if he would consider an offer to accept an important position in New York, and that he had cabled in reply that it was 'simply a question of terms and conditions,' and that he had requested particulars; that the particulars came, and it proved to be a definite offer of a position as president of a large holding company, controlling sev-

eral other corporations, with certain stock benefits and other advantages to himself, which, with the salary, made it equivalent to \$50,000 a year; that he did not at once accept the offer, but delayed it for a few days, in order to cable the Secretary of War, during which the parties increased their proposal between ten and fifteen thousand dollars a year, making it equivalent to \$60,000 or \$65,000.

"He stated that the position was an especially attractive one and such as he had only hoped to obtain after the completion of the canal, and thus only after years of further service on the Isthmus; that the duties of the new position were especially agreeable and afforded opportunities to make money through investments, etc.; further, that the position was such a good one that he did not consider that he could decline it; that life on the Isthmus was lonely and accompanied with risk to himself and wife, and was another reason for accepting a better offer; but that his new duties would not require all of his attention for the next two months, and that the parties had agreed that he could close up his canal work in the meantime, always provided it did not take him from New York to the Isthmus. He referred to the President's order appointing the original commission and in which the President had stated that the commissioners would hold office subject to the due fulfillment of their duties, and he stated that this made the office subject to termination by the President, and that consequently he (Mr. Wallace) considered that the holder of the office had an equal right to retire from it at his option at any time.

WILLING TO PREPARE A REPORT.

"Concluding, he stated that while he was thus severing his connection with the canal work he was willing to make up his annual report, and he would, if desired by the Government, continue to serve as a commissioner, but not as chief engineer in charge of the construction work on the Isthmus.

"Mr. Wallace said that this was all he had to say in regard to his personal relation to the work, and that he would then proceed to discuss generally the conditions on the Isthmus if the Secretary desired. Secretary Taft said he wished Mr. Wallace would continue his general statement.

"Mr. Wallace then discussed conditions on the Isthmus and the work impersonally for half an hour. At the conclusion of Mr. Wallace's general statement the Secretary of War said, in substance, as follows:

"Mr. Wallace, I am inexpressibly disappointed, not only because you have taken this step, but because you seem so utterly insensible of the significance of your conduct. You come with the bald announcement that you quit your task at a critical moment, on the eve of important work, and in the midst of reorganization plans under which you accepted your position, with your department unperfected in organization, and when you know, too, that my public duties call me to the Philippines for several months. I must be allowed to remind you that when you were employed by the Commission a little over a year ago, you were only receiving \$15,000 per annum under your former position, and that your salary was fixed at the sum demanded by yourself, \$25,000. That was for constant service on the Isthmus, where the construction work was to be performed and your services were required. You knew the risks to yourself and to your family, if they went with you, in the work you assumed an obligation to do. If you had not desired the position you need not have sought nor accepted it, but I understand that quite the contrary was the case

CONSULTED ABOUT EVERY FEATURE.

"I can refer more positively to recent events within my own knowledge. When the President found it necessary to make a reorganization of the former Commission you were consulted in the frankest manner about every feature of the reorganization and were encouraged freely to express your opinions. Indeed, your voluntary suggestions from the Isthmus embraced the proposal that you yourself be made a member of the Commission and chief engineer on the Isthmus. * * *

"The new plan of organization was warmly accepted and indorsed by you when you arrived in Washington, and you expressed your hearty approval of it in the most unequivocal manner, not only to the President and myself, but to members of the Commission and its counsel, and just before sailing for the Isthmus you called upon us and voluntarily thanked me in the warmest terms for what had been done in the reorganization of the canal work in the position which had been given you. You cooperated for all these weeks in the work of reorganization, and accepted the position assigned you under the President's order of April 1. The President and myself relied upon this fact in making up the plans, and the other members were accepted with that in view.

"Now, within twelve days after your arrival upon the Isthmus you send me a cable, which, read in the light of what you say to-day, signifies your practical acceptance of an offer of another position inconsistent with the performance of your duties on the Isthmus. I am astonished that you should be so disregardful of the splendid opportunities of the position which would have made you famous the world over by the honorable performance of your duties of chief engineer.

PERSUADED BY LARGER OFFER.

"For mere lucre you change your position overnight without thought of the embarrassing position in which you place your government by this action, when the engineering forces on the Isthmus are left without a real head and your department is not perfected in organization; when the advisory board of engineers is to assemble under call of the President within two months, and when I am departing for the Philippines on public duty. All this you knew as well as I know it, but it has not had the least influence upon your action—you have thought of yourself and yourself alone. I consider that by every principle of honor and duty you were bound to treat the subject differently. You have permitted the President and all of us to proceed in full confidence that you would perform the functions of chief engineer, and now, in an hour, you drop your great duties and throw them back upon us as if it were a matter of no consequence, and all this for your personal advantage solely.

"Mr. Wallace, I do not agree with your idea of your rights, nor with your idea as to your duties. I do not agree that the President's original order giving him the right to discharge an unfaithful commissioner gave you the right to abandon your duties at a critical moment; but independent of that original order, you accepted the duties of chief engineer on the Isthmus under the recent order of April 1, which was made in cooperation with you and to suit your views. More than this, your duty in the premises is not measured by your mere legal contractual rights. It should be measured by the high obligation of a public officer with a sacred allegiance to the Government it should be his honor and his pleasure to serve. You were, therefore, in honor bound by all that has preceded to continue to perform your duties upon the Isthmus until such time—a year at least—as would have afforded us reasonable opportunity to select a competent successor and prepare him for the great duties of that office.

NO COMPLAINT AGAINST ASSOCIATES.

"You make not the least complaint against your associates—superior or inferior (I know of no possible ground for any). You are influenced solely by your personal advantage.

"Great fame attached to your office, but also equal responsibility, and now you desert them in an hour. Even from a standpoint of policy, you are making a profound mistake. If you could withdraw from your new arrangements, which I do not suggest, I could have no confidence (since I know now your conception of duty) that you would not in the future repeat the same act at a moment even more critical, when the consequences might be even more embarrassing and injurious to the Government.

"Under these circumstances, Mr. Wallace, and with great personal pain and disappointment, I am bound to say that I consider the public interest requires that you tender your resignation at this moment, and turn over the records of your office to the chairman of the Commission."

"In reply Mr. Wallace stated that he was deeply disturbed at the view of the subject taken by the Secretary; that he had considered that he had a right to retire when he chose, but that, as he had said, he was desirous of talking it all over and making some arrangement whereby the Government could use his services in some capacity.

REPLY OF SECRETARY TAFT.

"The Secretary answered in substance: 'Mr. Wallace, further talk is useless. It would be to dicker. I can not dicker on such a grave subject. I have assumed that you have given this subject the greatest consideration, and you have approached it deliberately and stated to me your action in set and definite terms. You have unmistakably announced that you propose to accept a position so attractive that you could not possibly afford to decline it, and that you would not henceforth perform any duties for the Government as inconsistent with serving your new masters, who require your constant presence in New York, and therefore that you could not and would not go back to Panama as chief engineer.'

"Mr. Wallace again stated that he deeply regretted that the Secretary's point of view was different from his own, and said that he would send his resignations as soon

as he got back to his hotel, and would address them to the President, through the Secretary. He added: 'Mr. Secretary, while there is a difference between us as to the point of view we take concerning my duty, I consider that there can be no question that I have performed my full duty up to this hour.'

"To this the Secretary replied in effect: 'Mr. Wallace, I do not consider that any man can divide such a duty up to any one point where it suits him to stop, and then claim that he has fulfilled his duty by merely performing it up to the point of his own selection. In my view a duty is an entirety, and is not fulfilled unless it is wholly fulfilled.'

"HIS RESIGNATION SUBMITTED.

"Agreeably to the said request of the Secretary, Mr. Wallace submitted his resignation as follows:

"NEW YORK, June 26, 1905.

"THE PRESIDENT, *White House, Washington, D. C.*

"Through the Secretary of War.

"SIR: I have the honor to hereby tender my resignation as member of the Isthmian Canal Commission, to take effect at such time as may suit your pleasure and convenience. Very respectfully,

"JOHN F. WALLACE,

"Member Isthmian Canal Commission.'

"Similar resignations as chief engineer and as vice-president, general manager, and director of the Panama Railroad were submitted.

"After consideration of the foregoing and personal conference with the Secretary of War, the President issued the following order:

"CAMBRIDGE, MASS., June 28, 1905.

"SIR: Your resignation as member and chief engineer of the Isthmian Canal Commission, tendered in accordance with the request of Secretary Taft, which request, under the circumstances, has my entire approval, is hereby accepted, to take effect immediately.

"Very truly, yours,

"THEODORE ROOSEVELT.

"MR. JOHN F. WALLACE,

"Isthmian Canal Commission, Washington, D. C.'

"The successor of Mr. Wallace as chief engineer will be announced within a few days."

ISTHMIAN CANAL.

COMMITTEE ON INTEROCEANIC CANALS,
UNITED STATES SENATE,
Washington, D. C., Tuesday, March 6, 1906.

The committee met at 10.30 o'clock a. m.

Present: Senators Millard (chairman), Kittredge, Ankeny, Morgan, Taliaferro, and Simmons.

FURTHER TESTIMONY OF THEODORE P. SHONTS, ESQ.

Senator TALIAFERRO. Mr. Shonts, was there referred to you by the President of the United States a protest signed by Hudgins & Dumas as to your letting this contract to Mr. Markel?

Mr. SHONTS. Yes, sir.

Senator TALIAFERRO. Did you make a report to the President on that protest?

Mr. SHONTS. Yes, sir.

Senator TALIAFERRO. Have you a copy of that report?

Mr. SHONTS. Yes, sir.

Senator TALIAFERRO. Have you it in your papers?

Mr. SHONTS. Yes, sir.

Senator TALIAFERRO. Will you let me see it?

Mr. SHONTS. I will be very glad to.

Senator TALIAFERRO. I would like to have the telegram go in the minutes. I will read it, Mr. Shonts, and if this is the telegram please say so. If not, let us know. (Reading:)

"NEW YORK, September 7, 1905.

"The PRESIDENT, Oyster Bay, Long Island."

That was the day, I think, that you let this Markel contract.

Mr. SHONTS. September 7—well, the contract will show. I am not sure; I think it was the 6th or 7th.

Senator TALIAFERRO (reading): "In the public interest, we earnestly appeal to you to direct the chairman of the Isthmian Canal Commission to withhold the award to J. E. Markel, of Omaha, Nebr., of certain concessions for conducting hotels, boarding camps, and commissary stores on the Isthmus of Panama. These concessions are the most important of the kind ever granted by the United States Government, involving a business which, it is estimated, will aggregate the enormous total of \$50,000,000 for the term of the contract.

"Circumstances connected with the awarding of this privilege seem to indicate collusion, one entire section of our bid having, as we discovered by examination yesterday, been credited to Mr. Markel as

an original production, while the precipitancy with which bids were called for, without public advertisement and with no regular time set for receiving and opening said bids in the presence of the bidders, warrant us in the assumption that a predisposition existed to award the contract to Mr. Markel, and that other considerations were sacrificed to this end.

"In placing this matter before you, Mr. President, we specifically waive any claim to the Panama concession. Our only desire now is to prevent the consummation of what we deem an irregular proceeding, and in furtherance of this purpose we have, by advice of counsel, formally withdrawn our bid in a letter to Chairman Shonts.

"Respectfully.

"HUDGINS & DUMAS."

Is that the telegram as you remember it?

Mr. SHONTS. As I remember it; yes, sir.

Senator TALIAFERRO. And you made a report to the President on the subject?

Mr. SHONTS. To the President; yes, sir.

Senator TALIAFERRO. And you have that report, or a copy of it?

Mr. SHONTS. I have a copy of it before me. Shall I read it?

Senator TALIAFERRO. I have no objection, Mr. Shonts. It can go in the record just after the telegram.

Mr. SHONTS (reading):

"PANAMA RAILROAD COMPANY, PANAMA RAILROAD,

"PANAMA RAILROAD STEAMSHIP LINE,

"New York, September 11, 1905.

"HON. THEODORE ROOSEVELT, *Oyster Bay, Long Island.*

"DEAR MR. PRESIDENT: I am in receipt of Mr. Loeb's letter referring to telegrams and letters from Messrs. Hudgins & Dumas and H. Balfe to you concerning hotel and camp privileges.

"As I have already reported to you, we found upon our arrival at the Isthmus on July 26 a most pressing necessity for immediate arrangements for feeding our employees, so much so that Governor Magoon, Mr. Stevens, and myself gave this matter our first consideration. After examining the ground we decided that my first duty upon returning to the States would be to arrange for the granting of this privilege to the proper parties, and also for the placing of refrigerating plants upon our ships, building cold-storage plants at Colon, and providing for refrigerator cars to transport refrigerated material to the various camps along the Panama Railroad.

"It was also determined that this matter should be handled by the Panama Railroad and not by the Isthmian Canal Commission, as the commissary department was already in charge of the railroad company and that company was already operating one hotel at Colon.

"I found Mr. Jacob E. Markel on the Isthmus when I arrived there, he having gone down at the instance of Mr. Wallace to study the situation and having been detained by Governor Magoon a few days to await our arrival.

"It was decided while on the Isthmus that the railroad company should furnish the plant, including the buildings and equipment; that it should maintain the buildings and the contractor maintain the equipment, so that in the event of it becoming necessary for the

railroad to cancel the contract we could control the entire plant. When our general purchasing officer, Mr. Ross, and I returned to the States we immediately began the preparation of such specifications as we thought necessary to enable us to properly receive proposals for the feeding privilege. Before Mr. Markel left the Isthmus we had told him we expected to take this step upon our return and would like to have him make a proposal when we got ready to submit specifications. We later received communications from Messrs. Hudgins & Dumas and Mr. Balfe, asking for opportunity to make proposals.

"As soon as the specifications were drafted we mailed to Mr. Markel, to Hudgins & Dumas, and to Mr. Balfe each a copy in the same form and invited proposals. We did not advertise, because it was a railroad matter, and because of the urgency of the case. I have had several cablegrams from Mr. Stevens since my return asking me to expedite the arrangement, as existing conditions were very bad.

"After we had mailed the specifications to the firms named I came to New York and met all these parties. I explained to them that I was not a hotel man; that we had done the best we could as to the specifications, but would be glad to receive any suggestions from them as to the form of the specifications.

"Our specifications as prepared had included a general menu for silver men and gold men in order only to establish a standard, but when Messrs. Hudgins & Dumas attended the conference referred to they suggested the insertion of a weekly menu in the specifications instead of a general one. I asked them for a form of weekly menu. When they brought it to me I examined it, and considering it an excellent suggestion, I asked Mr. Ross to have it inserted as a part of our specifications, applicable to all alike, so that all could make proposals on the same basis. All were notified of our amended specifications, and all submitted proposals on that basis. Of course there is nothing original in the menu, but by inserting it in our specifications it satisfied Hudgins & Dumas and Balfe as well as ourselves, and it placed all parties upon an equality.

"It was not until after this that the three proposals were submitted. All proposals were made upon precisely the same form of specification. When the proposals were received I found that Mr. Balfe's was 50 per cent higher than Mr. Markel in some items, and that Hudgins & Dumas were so much under either of the others that I feared there was some misunderstanding on their part as to the meaning of the specifications. I thereupon wrote them a letter amplifying the specifications, going more into detail, and particularly calling their attention to two things: first, that the privilege in regard to uncooked food and other things might have to be withdrawn, because of our treaty agreements with the Republic of Panama (in case local prices of the Panama merchants were again reduced to a reasonable rate), and, second, that the low rates of freight we had made via our steamship line and railroad, and also for cold storage, were limited absolutely to food supplies to be used by our employees, and I gave them an opportunity (if they did not understand the specifications) to amend their proposal.

"They immediately amended their proposal, raising their prices on some items over 100 per cent; and when they brought the amended

proposal to my office they thanked me for having given them the additional information and for calling attention to the points above mentioned, also stating that they had not thoroughly understood the situation before and had made their prices on cooked meals at cost or lower, expecting to make their profits on the sale of other goods. Simultaneously with writing this letter referred to to Hudgins & Dumas I wrote exactly the same letter to Mr. Markel, so that if he had labored under any misrepresentation he also could amend his proposal."

Senator TALIAFERRO. May I interrupt you?

Mr. SHONTS. Yes, sir.

Senator TALIAFERRO. Do you think you wrote exactly the same letter to Mr. Markel?

Mr. SHONTS. The substance of it was the same all through; yes, sir.

Senator TALIAFERRO. Why did you not write exactly the same?

Mr. SHONTS. There were some local conditions in the one that did not exist in the other. For instance, I thought, Messrs. Hudgins & Dumas's prices being so much lower than either of the others, that there was some misunderstanding or they would not have had them so low; and Markel's not being so low, as I recollect the letters, I did not call attention to the lowness of his figures.

Senator TALIAFERRO. I ought not to have interrupted you.

Senator SIMMONS. May I ask you a question right there?

Mr. SHONTS. Yes.

Senator SIMMONS. In your original specifications, upon which the first bid was made, did you make it plain that they were to enjoy the privilege of selling uncooked food?

Mr. SHONTS. Yes.

Senator SIMMONS. So that, undoubtedly, the first bid was based upon the supposition or the hypothesis that they would have the right to sell uncooked food?

Mr. SHONTS. Yes, sir.

Senator SIMMONS. And subsequently you discovered that the treaty with the Republic of Panama might interfere with that?

Mr. SHONTS. Well, I knew it, but it did not occur to me at the time. It did not occur to me until I saw this very wide discrepancy in the prices.

Senator TALIAFERRO. You are quite clear in your recollection that the second letter, giving Hudgins & Dumas the opportunity of re-vamping, as you expressed it, their figures, their bid, made it absolutely clear to them that they would not be allowed to sell uncooked food?

Mr. SHONTS. No; I called their attention to the fact that that privilege might have to be withdrawn if the prices of food supplies locally on the Isthmus became reasonable again.

Senator SIMMONS. And then did you advise them to make their second proposition eliminating all possible or probable profits?

Mr. SHONTS. No, no; I did not do that. I simply called their attention to that, so that they would understand that that might happen; and they came right back and said that they had made their bids on the cooked food extremely low, either at cost or below, expecting to make a profit out of it, and if that privilege might be withdrawn then they wanted to raise their prices on the cooked food, the cooked meals, which they did over 100 per cent in some instances.

Senator TALIAFERRO. In other words, Mr. Shonts, in this second letter that you wrote them, this letter calling their attention to certain things that they had bid on lower than they would have done with all the facts before them, you stated clearly and fully the facts contained in your present statement?

Mr. SHONTS. If you will permit me just to state what was in my mind when I wrote the letter I think perhaps that would cover it all.

Senator TALIAFERRO. No, Mr. Shonts; I do not want what was in your mind. I am asking you now as to what you wrote.

Mr. SHONTS. Yes.

Senator TALIAFERRO. Not what you had in mind.

Mr. SHONTS. Oh! I have not read those letters over for a long time; but I know that I intended to write them exactly the same letter, unless there was that one difference—that I think I said in their letter that because their prices were so low I was afraid they had misunderstood some of the specifications, and I do not think I said that to Markel. As I recollect it, that was the difference.

If you will permit me, then, to say how I came to write that letter: Markel, I knew, had been on the Isthmus. I knew that Markel was familiar with some of these things, for he had been present when Magoon and Stevens and I had discussed them. I did not think that Hudgins & Dumas had as clear an idea as to the conditions that existed there, and I thought that it was only fair to them to call their attention particularly to what might happen, so that if they did bid, if they did come back and say, "We understood that, and that is our bid," that would have settled the matter. I would have called their attention, and I would then have felt that I had done everything in my power to prevent a misunderstanding.

Senator SIMMONS. As the result of these various conferences at which Markel had been present, in which you say he might have gotten this information, was anything said that would have conveyed to Markel's mind the idea that you have described, that in certain possible contingencies he would not be permitted to make any profit out of the sale of uncooked food?

Mr. SHONTS. He was present (I am not sure, but I think he was) at Governor Magoon's porch one evening when we were discussing what we should do in regard to opening these commissaries, what the wording or the interpretation of that treaty was that we discussed when I was here before, which Secretary Taft gave. The language was that if prices became unreasonable we could sell; and we thought prices had become unreasonable, so we took advantage of that, and did open these commissaries. But the agreement then entered into between Governor Magoon on the one side and President Amador on the other was that if prices again came down to a reasonable basis, then we would withdraw the commissaries.

Senator SIMMONS. And you think Markel understood that?

Mr. SHONTS. And I thought he understood it, but I was not sure, because I wrote him the same letter.

Senator SIMMONS. I am not asking what you thought then; but do you think now, speaking now, that he did understand it?

Mr. SHONTS. I think he did; yes; oh, yes. He answered and said in his letter that he did understand it, but when I wrote the letter I was not sure, so I sent him the same letter. I wanted to be sure that these people had the opportunity of knowing that that privilege

might be withdrawn, so I sent them the letter; and they answered, as I stated, raising their prices in some instances over 100 per cent. When they brought the communication up they thanked me for calling their attention to it, just as I have written the President here. They said that they had not understood the situation and that they had made their prices on cooked meals at cost or lower, expecting to make their profits on the sale of the other goods.

Senator SIMMONS. Now, do you give it as your opinion that after Hudgins & Dumas had raised their bid their bid was, taken as a whole, as high as Markel's or higher?

Mr. SHONTS. I think it was higher. May I break in on the reading of this paper—

Senator TALIAFERRO (to Senator Simmons). I think you had better let him finish that. He can answer that question, but when it comes to going into another matter I think he had better finish this first.

Mr. SHONTS. All right. I will finish reading this and then I will show you the comparison or estimate here that I have made. [Reading:]

"Simultaneously with writing this letter referred to to Hudgins & Dumas I wrote exactly the same letter to Mr. Markel, so that if he had labored under any misapprehension he also could amend his proposal."

I say "exactly." It was substantially the same. There may have been a difference as to the sentence that you asked about, Senator, but the points I wanted to cover were exactly the same. [Reading:]

"Mr. Markel replied that having a thorough knowledge of the situation on the Isthmus, he had considered these matters in making his proposal, and stated he 'stood pat' on same. I did not write Mr. Balfe, because his prices were so high that it was not necessary to longer consider him in the matter."

I knew that his prices were prohibitive. [Reading:]

"When these amended proposals were received, it was found that in every item but one Mr. Markel was either as low or lower than Messrs. Hudgins & Dumas.

"In making the award I took into consideration not only the prices, but the experience of the bidders, and the organizations for the business that they now have. I found that Messrs. Hudgins & Dumas have had no experience in this business except a three-year contract on Ellis Island, a purely local proposition."

What I meant by "local proposition" was that they had a market at their door. [Reading:]

"That Mr. Markel has had thirty years' experience in this special field of operating railroad hotels and construction camps on the Union Pacific, Illinois Central; Chicago, Burlington and Quincy; Kansas City Southern, and other roads; that he now has large camps on two or three of these roads; that he has such a large force that he can withdraw from it sufficient help to promptly equip the hotels we have constructed, and will also be in a position (if the climate affects his staff) to keep supplying new men from his force in the United States as exigency demands and letting those on the Isthmus return here to recuperate, thus having a constant chain of fresh employees going to the Isthmus.

"In view of the fact that Mr. Markel has been doing for thirty years exactly this kind of work in the States that he will have to do on the Isthmus"—

That is, feeding people at the frontier—[reading:]

"It seemed to me that even if his prices had been somewhat higher the company could well afford to pay something for his wide experience in this line of work, as against two young men who have had but a local experience in the city of New York; but I think, however, that Mr. Markel's rates will average lower than that of Hudgins & Dumas, although that is a difficult matter to determine, because no one can tell how many of each class of meals will be served.

"Permit me to express the view that under the circumstances it was not requisite for us to invite proposals at all, although often in respect to railroad matters I pursue this course wherever better results can be obtained; but I wish to call your attention especially to the fact that we do not buy the food, nor do we sell it, neither do we employ anybody to serve it or even keep the buildings in order. All of this is done by the holder of the privilege.

"Again, that it is entirely optional with the laborers to avail or not to avail of this opportunity, there being no requirement upon their part to either patronize the hotels or camps. We merely assure to them the choice of being fed in this way by a responsible party with good food at reasonable prices, thus guaranteeing them against extortion and assuring to them a means of sustenance on an economical basis."

That was the whole object of this privilege—to create conditions under which the employees on the Isthmus would have the opportunity of getting good food at reasonable prices; and my idea at that time (which has been justified by events) was that if we accomplished that thing the local prices would again become reasonable, and that the people would buy wherever they saw fit.

As proof of that, in November and December (which are the last two months of which we have reports, and which are the largest) the total sales to both gold and silver men for the two months were \$24,000. Half of that for one month multiplied by 12 would make the total of gross sales \$144,000 a year.

The CHAIRMAN. Sales of what, Mr. Shonts?

Mr. SHONTS. Gross receipts.

The CHAIRMAN. Gross receipts of the entire—

Mr. SHONTS. Gross receipts of both the gold hotels and the silver mess houses.

Senator SIMMONS. That is, you mean the gross receipts of the concessionaires?

Mr. SHONTS. Of ourselves; we are doing it. I am telling you just what my idea was when we gave this privilege.

Senator SIMMONS. The Government is doing it now?

Mr. SHONTS. Yes; the Government is doing it now. I am telling you what my idea was and how it has worked out. It has worked out as I thought—that when we succeeded in getting the prices down to reasonable prices it would result in the local people bringing their prices down. I do not know where they buy. There are, in round numbers, 17,000 of those laborers there, and we had an average during those two months of November and December, according to our last reports, of 327 people a day patronizing us.

Senator TALLAFERRO. That was your idea in making this contract?

Mr. SHONTS. Yes, sir; just as I have stated in this letter to the President.

Senator TALIAFERRO. That was not an afterthought, Mr. Shonts?

Mr. SHONTS. No, sir; I state it right here, away back at the time I wrote this letter, Mr. Senator. That was my idea all the time. I did not want to go into the hotel business.

Senator TALIAFERRO. You are quite clear about that, Mr. Shonts?

Mr. SHONTS. Oh, yes; we did not want to go into the hotel business. Why, of course, I do not know, and I did not know—no one could tell—how many would patronize the places or what the number of each class of meal would be that would be consumed. That was one reason that I say here in this letter, and testified when I was on here before, that if you do not know the number of meals of each class that will be consumed you can not tell which was the lowest, if they are very close to each other in their figures.

Senator TALIAFERRO. Your intention being to cancel that contract if the thing worked differently from the way you supposed it would, and if you saw that the contract was operating any hardship on the laborers on the Isthmus?

Mr. SHONTS. That is the reason I put in the thirty-day privilege of cancellation, if it was going to develop any great hardship.

Senator TALIAFERRO. Now, will you show the committee where you put in any thirty-day privilege in that original contract?

Mr. SHONTS. Yes.

Senator TALIAFERRO. Do so, please.

Mr. SHONTS (reading): "In the event that the contractor shall not perform his obligations under this agreement to the satisfaction of the general manager of the railroad company, the railroad company shall have the right to cancel this agreement at any time upon giving thirty days' notice to the contractor of such desire upon its part."

Senator TALIAFERRO. And you think that gave you the right to cancel that contract if it transpired that the contractor was living up to the terms and conditions of his contract?

Mr. SHONTS. Not if he was living up to the terms and conditions; but the language here is—

Senator TALIAFERRO. You have read the language, Mr. Shonts; we are quite familiar with it.

Mr. SHONTS. I know; but it has to be to the satisfaction of the chief engineer. Now, I think—

Senator TALIAFERRO. Pardon me a moment. His living up to the terms of his contract had to be satisfactory to the chairman of the Commission?

Mr. SHONTS. To the general manager of the railroad.

Senator TALIAFERRO. Well, this whole dealing was a Commission dealing until you came right up to the date of making that contract, Mr. Shonts; and if I say "Commission" where you think I ought to say "Railroad," they are so intermixed that—

Mr. SHONTS. That was not the point I was making, but that it was to be satisfactory to the man on the ground (I was making that distinction, Senator) as compared with myself; that was all.

Senator TALIAFERRO. So that as a matter of fact, while you had all these things in mind, that if this contract did not operate for the benefit of the Government and the laborers on the Isthmus you could cancel it, as a matter of fact you had no right to cancel it so long as the contractor lived up to the terms of his contract?

Mr. SHONTS. Well, there was another clause there that bore out my theory at that time, Senator, and that was that if we did serve that notice we would take over any supplies the contractor had on his hands and assume his contracts.

Senator TALIAFERRO. That is, where he violated his contract. That is, where he failed to live up to his contract. I know, Mr. Shonts, that there was a subsequent provision put in, Mr. Markel testifies, with his consent, that the contract might be canceled; but I am dealing with that question at the time when you prepared and made that contract and when you reported those facts to the President of the United States.

Mr. SHONTS. Yes.

Senator TALIAFERRO. And I want you to point out to this committee anything in that contract which justifies and warrants the statement you made there to the President of the United States.

Mr. SHONTS. That we had the right to cancel that contract?

Senator TALIAFERRO. Yes; so long as the contractor lived up to the conditions which the contract imposed.

Mr. SHONTS. As long as he lived up to the conditions, I presume, legally we would have no right.

Senator TALIAFERRO. Yes. Then your statement was not justified, I take it?

Mr. SHONTS. I still think that it was.

Senator TALIAFERRO. Will you read the statement again?

Mr. SHONTS. Yes, sir.

Senator TALIAFERRO. I do not mean in the contract.

Mr. SHONTS. This last paragraph that I just read?

Senator TALIAFERRO. I mean where you reported to the President that you had the right to cancel that contract at pleasure.

Mr. SHONTS. Perhaps I have not gotten to that yet.

Senator TALIAFERRO. Yes; you have read it.

Mr. SHONTS (after examining his report to the President). No; I do not think I have read that. I do not find it here. If you will let me finish—

Senator TALIAFERRO. All right, sir.

Mr. SHONTS. The last sentence was:

"Again, that it is entirely optional with the laborers to avail or not to avail of this opportunity, there being no requirement upon their part to either patronize the hotels or camps. We merely assure to them the choice of being fed in this way by a responsible party with good food at reasonable prices, thus guaranteeing them against extortion and assuring to them a means of sustenance on an economical basis. Of course the benefits to us, in the contentment, comfort, health, and working efficiency of our labor, is manifest. So much for the award.

"When I notified Mr. Balfe over the 'phone that his proposal was too high, I told him I would be glad to have him come in the next morning and examine the proposals if he desired to do so. He said he would be glad to avail of the offer, and did so, spending some time in my office with Mr. Ross, and making a careful examination of all three proposals. At the conclusion of his examination (and, so far as I know, before he knew who the successful bidder was) he said to Mr. Ross: 'I think that Mr. Markel is clearly the lowest bidder, and I want to be the first one to congratulate him. I would

now be glad to take the contract at his figures, but, of course, that would not be fair.' He then rose and said to me: 'Mr. Shonts, I never have been treated as nicely before in my life in a matter of this kind, and want to thank you for the courtesy you have extended to me, and to say that because of it if I can be of service to you or the successful bidder at any time I wish you would command me.'

"I wrote to Hudgins & Dumas advising them of my decision and inviting them also to come to the office and examine the proposals that had been made if they cared to do so. They called after I had left the office, but all the proposals were shown to them and examined by them.

"I feel that we have done the very best we could to place the privilege in able, experienced, and honest hands.

"As an illustration of how satisfactory a trade we have made, as judged by one of the most expert men in the country, and entirely disinterested, I will say that General Weston, the head of the Commissary Department of the Army, and not then knowing of the award, called and suggested to me that in place of granting a privilege we appoint a man whom he could recommend from the Army to take charge of the camps and hotels directly for the railroad; but when I read him Mr. Markel's proposition he said, 'Do you mean to say that you have that sort of a proposition from a responsible party?' And when I said 'Yes,' he replied: 'I withdraw my suggestion, for, considering what you get, I think you have made a much better arrangement than we ourselves have in the Commissary Department.'

"I beg leave to state that we have protected ourselves still further by reserving the right of constant supervision of the operations of the contractor and of cancellation of the privilege at any time upon thirty days' notice."

There it is, Senator, right at the close.

Senator TALIAFERRO. Now, I ask you again if you will point out in the contract any single provision that justified that statement to the President of the United States?

Mr. SHONTS. The clause that I read you is my interpretation of the contract that gave us that right.

Senator TALIAFERRO. Did you interpret it in that way at the time?

Mr. SHONTS. Yes, sir.

Senator TALIAFERRO. Do you interpret it that way still?

Mr. SHONTS. That was my idea at the time, and I think it would govern yet. I had not differentiated it as clearly as you state it now as a legal proposition, but that was the purpose.

Senator TALIAFERRO. Mr. Shonts, was it not your duty to consider it from every point of view before making such a statement as that to the President of the United States?

Mr. SHONTS. Yes, sir. Well, I am telling you the intention of the contract, and my statement to the President was exactly what I thought that contract gave us.

Senator TALIAFERRO. Are you a lawyer?

Mr. SHONTS. I am not very much of one. A great many years ago I was a small "limb of the law:" but we had Mr.——

Mr. ROSS. Mr. Charlton.

Mr. SHONTS. Mr. Charlton, Judge Charlton, to——

Senator TALIAFERRO. Mr. Chairman, I object to the witness being prompted from the outside. If there is any paper that he has in the hands of his clerk, I have no objection to his getting it from him.

The CHAIRMAN. You do not wish any suggestions made, then?

Senator TALIAFERRO. Except where Mr. Shonts wants to get papers; but if he desires to put Mr. Ross on the stand, it is his privilege.

The CHAIRMAN. Suppose he is at a loss as to dates or figures—you do not wish him to ask Mr. Ross as to them?

Senator TALIAFERRO. I wish him to say that he does not know, then. I have no wish to have you testify to things you do not know, Mr. Shonts; and if I ask you a question and you are not so familiar with the details of the business as to enable you to answer it intelligently, I do not expect you to answer it. I expect you to put somebody on the stand who is familiar with the details of this work. I know the details are voluminous, and I do not expect you to be familiar with them all.

Mr. SHONTS. I was proceeding as we did when I was on the stand before, when I asked for papers, etc.

The CHAIRMAN. I will say, Senator Taliaferro, that it has been the custom since the meeting of this committee to allow that. It was allowed in Mr. Cromwell's case; his partner made suggestions, and he had his satchels of papers, and his secretary was behind him; and it was allowed when Mr. Wallace was here. I did not suppose there was going to be any question about it; but if it is to be your desire, then, Mr. Shonts, you will please not refer any matter to Mr. Ross.

Senator TALIAFERRO. And I hope the rule will be enforced with all witnesses hereafter, Mr. Chairman.

The CHAIRMAN. Yes; but, as you know, it has not been the case before.

Senator TALIAFERRO. And I know that we have suffered by it before.

Mr. SHONTS. Mr. Senator, I would like to say, then, that the most of the work—the real work, in the preparation of the specifications—was done by Mr. Ross, with the assistance of Judge Charlton. They were in consultation with me, and I spent a good deal of time with them; but the actual work was done by those two gentlemen. That was the reason I asked Mr. Ross.

Senator TALIAFERRO. I wish to say, Mr. Shonts, that I did not mean to imply any improper motive.

Mr. SHONTS. No.

Senator TALIAFERRO. You state, in this report to the President of the United States, that Hudgins & Dumas were lower in one item than Markel.

Mr. SHONTS. Yes, sir.

Senator TALIAFERRO. What is that item?

Mr. SHONTS. Meals per month per person over 12 years of age among the silver employees.

Senator TALIAFERRO. What was Markel's bid for monthly board?

Mr. SHONTS. For which class of help?

Senator TALIAFERRO. The gold people.

Mr. SHONTS. If you will permit me, Senator, I might go over the whole thing and give it all to you at once.

Senator TALIAFERRO. I am going to get you to go over it in my way, Mr. Shonts, if you please.

Mr. SHONTS. Oh, all right. The reason I said that was because there were so many of those items.

Senator TALIAFERRO. He has a distinct bid for boarding the gold people?

Mr. SHONTS. Yes; but on different bases; that was all.

Senator TALIAFERRO. I am talking about monthly bases.

Mr. SHONTS. Well, meals per month per person over 12 years of age, gold roll, \$30.

Senator TALIAFERRO. What is Hudgins & Dumas's bid for the same thing?

Mr. SHONTS. Thirty dollars.

Senator TALIAFERRO. What was Markel's bid for taking care of the rooms per person per month?

Mr. SHONTS. Maintenance and care of rooms per month per person over 12 years of age—there were two bids on that.

Senator TALIAFERRO. I am speaking of adults.

Mr. SHONTS. As I say, there were two bids—one over 12 years of age and one under. Over 12 years of age, Hudgins & Dumas's bid was \$5 a month and Markel's was \$6. Over 5 and under 12, Hudgins & Dumas's was \$3 and Markel's was nothing.

Senator TALIAFERRO. Then Markel's bid for taking care of the rooms for adults was \$6 each per month?

Mr. SHONTS. Yes.

Senator TALIAFERRO. And Hudgins & Dumas's bid was \$5, \$1 less?

Mr. SHONTS. Yes.

Senator TALIAFERRO. So that Markel's bid for monthly board and taking care of the rooms was \$36?

Mr. SHONTS. Yes.

Senator TALIAFERRO. And Hudgins & Dumas's was \$35?

Mr. SHONTS. Yes.

Senator TALIAFERRO. Is there any difference there?

Mr. SHONTS. There is a difference of a dollar, considering those two items alone.

Senator TALIAFERRO. I am considering your report to the President, in which you state that there was only one item in which Hudgins & Dumas were lower than Markel.

Mr. SHONTS. That was on the question of meals per person over 12 years of age. I took the care of rooms together, Mr. Senator.

Senator TALIAFERRO. I am taking them together.

Mr. SHONTS. No; I took the whole family. Taking a family, if you have children under 12 years of age, Hudgins & Dumas charged \$5 for adults and \$3 for children, and Markel charged \$6 for adults and nothing for children. Now, in the case of families, Hudgins & Dumas would be higher. That was the idea that was in my mind in regard to that.

Senator TALIAFERRO. Do not Hudgins & Dumas make a bid for taking care of adults?

Mr. SHONTS. Yes.

Senator TALIAFERRO. And does not Markel bid for the same thing?

Mr. SHONTS. Yes.

Senator TALIAFERRO. Does not Hudgins & Dumas bid show that they are a dollar lower than Markel?

Mr. SHONTS. Yes; for adults.

Senator TALIAFERRO. Is not that an item in their bid?

Mr. SHONTS. Yes.

Senator TALIAFERRO. Then why do you say to the President that there is only one item in which they were lower?

Mr. SHONTS. I just explained to you that I took the care of rooms here as a total. I was trying to get at averages. That is what I was trying to get at, Mr. Senator; and in my judgment the average would be lower with Markel's than with Hudgins & Dumas's.

Senator TALIAFERRO. What proportion of these gold men on the Isthmus have their families with them?

Mr. SHONTS. Oh, there is a pretty good proportion, and it is a growing proportion. They all expect to have.

Senator TALIAFERRO. What, practically, was the proportion when you were considering that contract?

Mr. SHONTS. I could not answer that offhand. I do not know without looking it up.

Senator TALIAFERRO. Did you consider it at that time?

Mr. SHONTS. Oh, yes.

Senator TALIAFERRO. And you considered it without looking it up?

Mr. SHONTS. I considered it from the general impression that I had had when I was down there; but, now, to answer specifically as to the per cent, I could not do it.

Senator TALIAFERRO. I want your general impression, Mr. Shonts. What was your general impression as to the percentage?

Mr. SHONTS. At that particular time?

Senator TALIAFERRO. At that time.

Mr. SHONTS. At that particular time it did not guide me as much as what would be the conditions during the life of this contract if it was allowed to go ahead. We had decided on the policy of having the families of all our gold men come down there as fast as we could prepare quarters for them. That was the policy that we had outlined and decided on.

Senator TALIAFERRO. Let us go now to the silver roll. What was Markel's bid for taking care of the laborers—the silver men?

Mr. SHONTS. Twelve dollars. That was on the monthly basis.

Senator TALIAFERRO. On the monthly basis. And what was Hudgins & Dumas's bid?

Mr. SHONTS. Nine dollars.

Senator TALIAFERRO. There is some difference there, is there not?

Mr. SHONTS. Yes, sir.

Senator TALIAFERRO. Is that the difference that you referred to in your report to the President?

Mr. SHONTS. That was the one that was lower; yes, sir.

Senator TALIAFERRO. Is not the other just as clearly lower as that is lower on the gold employees? Does not the question of families come into the silver roll?

Mr. SHONTS. This is the question of monthly persons. On every other item in the silver roll Mr. Markel was lower; and I will say to you that it was told me at the time, and it has worked out since, that the number of silver people that lived by the month would be very small; that the most of the silver men patronized these places by the day or by the meal; and I have had a letter from Mr. Stevens recently in regard to why it is costing us so much to operate the gold hotels.

It is because even the gold men do not patronize us regularly. The hotels prepare meals, and they do not patronize them.

Senator TALIAFERRO. Mr. Shonts, please read the items of Markel's bid on the silver roll.

Mr. SHONTS. All of them?

Senator TALIAFERRO. Markel's bid right through.

Mr. SHONTS. "Meals per month, per person over 12 years of age, \$12." This is Markel's. Shall I make the comparison?

Senator TALIAFERRO. No, no; read it through.

Mr. SHONTS. "Meals per month, per person over 5 and under 12, \$5.

"Meals per day, per person over 12, 45 cents.

"Meals per day, per person over 5 and under 12, 20 cents.

"Meals per meal, per person over 12 years of age, 15 cents.

"Meals per meal, per person under 12 years of age, 10 cents."

Senator TALIAFERRO. So that you did not consider, when Hudgins & Dumas offered to do for \$35 this work for which Markel charged \$36, that Hudgins & Dumas were lower?

Mr. SHONTS. Taking those two items together alone, of course the Hudgins & Dumas bid would be lower, but that is not—

Senator TALIAFERRO. As a matter of fact, Mr. Shonts, are they not lower?

Mr. SHONTS. Do you mean on the whole proposition?

Senator TALIAFERRO. No; I mean on those two items.

Mr. SHONTS. On those two items they are a dollar lower.

Senator TALIAFERRO. Have you not brought to the President of the United States an expert in this business—a man who, you state, has been in the business for thirty or forty years, a man that you discovered, so to speak, you and Mr. Wallace and Judge Magoon between you—as being of all these people the fittest man to take this contract? He has come before this committee and has ignored the question of families in the white roll, and has made what he says is a fair and reasonable statement of what the result would be under the operation of his contract if it had gone into effect. Now, have you come here this morning to impeach your own expert?

Mr. SHONTS. No, sir; I am here this morning to answer your questions as best I can, and I am here to tell the facts that surrounded the making of the contract, and to give you the facts as to how it has worked out. I do not know what processes Mr. Markel went through in arriving at any of his conclusions—how he made any of his figures.

Senator TALIAFERRO. They are in the record, which is open to you.

Mr. SHONTS. I say I do not know about those things, and I am not undertaking to impeach him, because I do not know what they are. I am simply telling you what I know to be the facts from our point of view, and that is all, Senator.

Senator TALIAFERRO. Mr. Markel has testified here, Mr. Shonts, that his bid was accompanied by a menu of absolutely his own preparation. Is that true?

Mr. SHONTS. I do not know, I am sure.

Senator TALIAFERRO. Do you not know that the Hudgins & Dumas menu was attached to Mr. Markel's bid?

Mr. SHONTS. I had supposed it would be, for I wanted it to be, and gave instructions to have it given to him to be attached.

Senator TALIAFERRO. If it is attached, did Mr. Markel attach it?

Mr. SHONTS. I do not know, I am sure. I did not do any of that work myself, Senator.

Senator TALIAFERRO. That was done by your subordinates?

Mr. SHONTS. By my assistants; yes, sir. I know I wanted the specifications the same in that, just as in any other contract that we let.

Senator TALIAFERRO. Mr. Markel has testified, Mr. Shonts, that his own menu of his own personal preparing and no other was attached to his bid. In your testimony before this committee the impression is made on the minds of the committee that you gave or expected to be given to Mr. Markel the menu of Hudgins & Dumas.

Mr. SHONTS. That is it, because I thought—

Senator TALIAFERRO. Now, I want to know what you know about it.

Mr. SHONTS. Well, that is all I do know about it—I supposed it was given; I asked that it be given. I wanted the specifications the same all the way through, so that they would be bidding on the same idea.

Senator TALIAFERRO. Did the original bid of Markel arrive here this morning from New York?

Mr. SHONTS. Yes; well, I was told—

Senator TALIAFERRO. Is it among your papers?

Mr. SHONTS. I was told that it came last night. It is not among my papers. I have not them, but possibly Mr. Ross has them.

Senator TALIAFERRO. Have you seen the testimony of Mr. Markel?

Mr. SHONTS. No.

Senator TALIAFERRO. Have you looked at the exhibit he presented to this committee to show what the operation of his contract would be from the point of view of an expert?

Mr. SHONTS. How it would work out?

Senator TALIAFERRO. Yes.

Mr. SHONTS. No, sir.

Senator TALIAFERRO. Will you look at it, please? It is on the top of that page there. Please read it to the committee.

Mr. SHONTS (reading): "This exhibit contemplates operating the following numbers of hotels and camps:

"First year, 2 hotels, 300 gold-roll men; 5 camps, 1,000 silver-roll men.

"Second year, 4 hotels, 600 gold-roll men; 10 camps, 2,000 silver-roll men.

"Third, fourth, and fifth years, 6 hotels, 900 gold-roll men; 25 camps, 5,000 silver-roll men.

"There has not been added to the foregoing exhibit of cost anything for expenses of contractor and partners or for maintenance of New York office."

Senator TALIAFERRO. That is all I care for you to read. Now, do you regard that you were more capable of judging as to what that contract would work out at the time it was made, or Mr. Markel? Which was the best judge of how it would work out?

Mr. SHONTS. Well, in view of the way it developed, I think I guessed better than he did.

Senator TALIAFERRO. I am speaking of the time you made the contract, Mr. Shonts.

Mr. SHONTS. I also am trying to speak of that time, and say that my conclusion at that time was that if we made arrangements which

would give to people on the Isthmus the chance of buying food at reasonable prices it would break down the high prices that prevailed there, and the people would get them outside; and they have been doing it. I never did have the exaggerated idea of the size of this that even my own associates have, Mr. Senator.

Senator TALIAFERRO. You are president of the Commission, Mr. Shonts?

Mr. SHONTS. Yes, sir.

Senator TALIAFERRO. Whom do you regard as the men on your staff who are charged most particularly with the working out of the details of the construction down there, both in Washington and on the Isthmus?

Mr. SHONTS. The work is so divided up, Mr. Senator, that it is somewhat difficult to state. In regard to accounts, Mr. Benson has charge.

Senator MORGAN. You are speaking now of the work on the canal?

Senator TALIAFERRO. Yes; of the work on the canal.

Senator MORGAN. Not the railroad?

Senator TALIAFERRO. Not the railroad; no.

Mr. SHONTS. Mr. Benson has charge of the accounts. Mr. Ross has charge of the purchasing.

Senator TALIAFERRO. One moment, please. Mr. Benson you call the auditor?

Mr. SHONTS. The general auditor; yes, sir.

Senator TALIAFERRO. Go on, Mr. Shonts.

Mr. SHONTS. Mr. Ross is the general purchasing officer. Mr. Jester is disbursing officer here.

Senator TALIAFERRO. The local purchasing agent?

Mr. SHONTS. No, sir; he is disbursing officer in the States. In charge of construction and engineering on the Isthmus is Mr. Stevens. In charge of government and sanitation is Judge Magoon.

Senator TALIAFERRO. Where was Mr. Benson from when he came into this work?

Mr. SHONTS. The Southern Pacific.

Senator TALIAFERRO. Where was Mr. Ross from?

Mr. SHONTS. Chicago. He is from the Illinois Central Railroad. They are railroad men.

Senator TALIAFERRO. And Mr. Jester?

Mr. SHONTS. Mr. Jester I found here. I think he is an old Government employee.

Senator TALIAFERRO. He is the disbursing officer?

Mr. SHONTS. Yes, sir.

Senator TALIAFERRO. Where is Mr. Stevens from?

Mr. SHONTS. Mr. Stevens did his greatest work in engineering on the Great Northern Railroad. His last position before coming with us was vice-president of the Rock Island system.

Senator TALIAFERRO. You, I believe, Mr. Shonts, are president of the Clover Leaf Railroad?

Mr. SHONTS. Yes, sir.

Senator TALIAFERRO. Are all these railroads that you have spoken of, the one that Mr. Benson came from, and the one that Mr. Stevens came from, as well as the Clover Leaf, what you might term the transcontinental system?

Mr. SHONTS. No; the Rock Island is not a transcontinental system, although it is a part of one. It is getting out there very rapidly. The Clover Leaf is not. It is a small road.

Senator TALIAFERRO. It is very largely confined to business over the transcontinental system?

Mr. SHONTS. No, sir; not very largely; a very small proportion.

Senator TALIAFERRO. You would classify it, though, directly or remotely, as in one of those systems?

Mr. SHONTS. Yes, sir. The Clover Leaf is a very small concern.

Senator TALIAFERRO. Do you expect to continue in the presidency of the Clover Leaf?

Mr. SHONTS. Well, that depends.

Senator TALIAFERRO. On what?

Mr. SHONTS. The President spoke to me about that some little time ago, and I told him that when I came with the Commission my relations with the Clover Leaf were known, and my large interest was known, that I spoke of; that my duties are only nominal now, but on account of my large holdings I did not want to give up the presidency if it could be avoided; but that, at the same time, I did not feel like embarrassing him and the Administration, if it reached that point. I hoped it would not, because I could protect my interests better as president than I could otherwise.

Senator TALIAFERRO. You have not made up your mind, then, Mr. Shonts?

Mr. SHONTS. I notified the President to that effect. I am expecting that he will tell me what he wants me to do when the proper time comes.

Senator TALIAFERRO. Your remaining with the railroad, then, will depend upon the wishes of the President in the matter?

Mr. SHONTS. Well, particularly in regard to the salary question. He said he did not think there would be any objection to my being the nominal president, without salary, because I explained to him more in detail than I am doing now why I could protect my interests better.

Senator TALIAFERRO. Have you said to anybody, Mr. Shonts, that you would give up your railroad connection if you were allowed a reasonable time in which to dispose of it without loss to yourself?

Mr. SHONTS. Yes, sir. I said that to the President that if I could get out in a reasonable time I would be very glad to do so, and I have told some of my associates that.

Senator TALIAFERRO. Well, I would like to know, Mr. Shonts, what your intentions are, and I think other members of the committee would like to know, and it is for that reason that I am asking these questions.

Mr. SHONTS. I have told you just the substance of my conversation with the President, and that is the condition it is in now. I will say this, that I am conducting some negotiations. You can not tell how they will terminate until they are through.

Senator TALIAFERRO. So that you are not prepared to say now what you will do in that regard?

Mr. SHONTS. I can not, very well. I have said to the President what I will do in regard to the question of salary.

Senator TALIAFERRO. So that all of these men, including yourself, who are charged with the work of building this canal are either now or have recently been connected with one of the transcontinental systems?

Mr. SHONTS. No, sir; Mr. Ross—

Senator TALIAFERRO. With the exception of Mr. Jester?

Mr. SHONTS. No; Mr. Ross is from the Illinois Central, and that is not a transcontinental system. It is a north-and-south road, chiefly; and I am not from a transcontinental road.

Senator TALIAFERRO. Is not the alliance more or less close between the Illinois Central—

Mr. SHONTS. I do not know a thing about its relations or its connections; but it is not regarded as one of the transcontinental lines, in general.

Senator TALIAFERRO. I do not speak of the impressions about these lines. I speak of the facts.

Mr. SHONTS. I am giving you the facts. I do not know their relations. But I say that the general impression is that it is not a transcontinental line. Geographically it would not be reasonable that it should be considered as a transcontinental line. It is a north-and-south line.

Senator MORGAN. Has that company any traffic relations with any transcontinental road?

Mr. SHONTS. It does, of course, have traffic relations with transcontinental roads.

Senator MORGAN. Under agreement?

Mr. SHONTS. That is, of course, what I do not know about. I have never had anything to do with the management.

Senator KITTREDGE. The Illinois Central extends as far west as Omaha, does it not?

Mr. SHONTS. Yes, sir.

Senator KITTREDGE. With what lines does it make connections at that point?

Mr. SHONTS. I suppose all lines diverging from Omaha.

Senator KITTREDGE. What lines are those?

Mr. SHONTS. The Union Pacific and the Burlington and the Northwestern have a line out from there—the Fremont, Elkhorn and Missouri Valley—and I think the Missouri Pacific has a line out from there.

Senator KITTREDGE. What lines of those you have mentioned are transcontinental lines?

Mr. SHONTS. What we understand in railroad parlance by transcontinental lines are the Northern Pacific, the Great Northern, the Union Pacific, the Atchison, and the Southern Pacific, which, of course, is owned or controlled by the Union Pacific. They are what we call the transcontinental lines. The Rock Island has got down into Texas, and I believe they have a through passenger service in connection with the Southern Pacific, which puts them in the category of transcontinental lines to a lesser extent.

Senator KITTREDGE. Is not the Rock Island out as far west as Colorado?

Mr. SHONTS. Yes; they are in Colorado, too.

Senator MORGAN. What is the length of the Clover Leaf line?

Mr. SHONTS. Four hundred and fifty-one miles. We run from Toledo to St. Louis. We are east of the Mississippi River.

Senator TALIAFERRO. I will change my question a little, Mr. Shonts. I will say that all of these gentlemen in the important positions which you have named, and who are charged with the practical work of building that canal, are either now or have recently been connected with transcontinental railway systems or with railroads having a traffic arrangement with transcontinental systems, except Mr. Jester, the disbursing officer?

Mr. SHONTS. Yes; except myself.

Senator TALIAFERRO. Is not your road a link in the transcontinental system?

Mr. SHONTS. No, sir; we only run from Toledo to St. Louis.

Senator TALIAFERRO. You have no traffic arrangement with any line that operates in connection with the transcontinental lines?

Mr. SHONTS. There are none of the transcontinental lines, so called, that run out of St. Louis.

Senator TALIAFERRO. Do you not have a traffic arrangement as to freight or passengers?

Mr. SHONTS. We exchange freight at the Mississippi River, not with the transcontinental roads, but with the roads leading up there.

Senator TALIAFERRO. And having connection with the transcontinental roads?

Mr. SHONTS. Yes, sir.

Senator MORGAN. Can you bill goods or give passenger tickets on your line to reach the Pacific coast?

Mr. SHONTS. Yes, sir.

Senator MORGAN. That is by arrangement with the transcontinental line?

Mr. SHONTS. With the intermediate line leading into the transcontinental line.

Senator MORGAN. But you would be, in the parlance that is now very prevalent, what is called an interstate railway?

Mr. SHONTS. We are an interstate railway; yes, sir.

Senator MORGAN. And that interstate relation, by your traffic arrangement, would extend to the Pacific coast?

Mr. SHONTS. Yes, we have a traffic arrangement by which we accept freight and passengers and give freight and passengers.

Senator KITTREDGE. Do you bill freight clear through?

Mr. SHONTS. We do not bill it through; no, sir.

Senator KITTREDGE. How far west?

Mr. SHONTS. We only bill to St. Louis. We issue through bills of lading, however.

Senator KITTREDGE. To what points? To the Pacific coast?

Mr. SHONTS. Yes, sir; but we only bill locally. The Mississippi River is a natural dividing point.

Senator KITTREDGE. That is a matter of convenience—an arrangement between the roads?

Mr. SHONTS. That is just a custom that has grown up.

Senator MORGAN. Do you know of any great railroad in the United States that has not got these traffic arrangements with the Pacific coast over the transcontinental lines?

Mr. SHONTS. No, sir.

Senator MORGAN. They all have them?

Mr. SHONTS. Yes, sir. I was only making a distinction between the so-called transcontinental roads, or the roads that are so called in railroad parlance, and the other railroads. That was all.

Senator MORGAN. I am speaking of the interstate lines that extend their traffic to the Pacific coast.

Mr. SHONTS. Yes; they exchange traffic clear through both ways.

Senator MORGAN. So that, in respect to the travel across the continent, there is one general combination in force?

Mr. SHONTS. Yes, sir.

Senator KITTREDGE. In what manner was it decided that the Markel contract should be made with the railway company?

Mr. SHONTS. There were three things taken into consideration.

Senator MORGAN. Senator, I wish you would amend your question so as to ask by whom it was decided.

Senator KITTREDGE. I will get to that. I have that in mind, Senator.

Senator MORGAN. Very good.

(By request, the stenographer read the pending question of Senator Kittredge.)

Mr. SHONTS. You mean, the reasons for——

Senator KITTREDGE. In what manner was the decision reached that you would make this Markel contract with the Panama Railway Company?

Senator MORGAN. You mean instead of with the Isthmian Canal Commission?

Senator KITTREDGE. Yes.

Mr. SHONTS. In talking it over on the Isthmus with Governor Magoon and Mr. Stevens and General Ernst, and a number of our Commissioners also who were down there, we decided that because the question of transportation entered so largely into the question of this privilege it would be better for the railroad to make the arrangement; second, the railroad had been operating hotels and a commissary, and they had a nucleus to commence with, and, third, if we made it a railroad matter the earnings could be turned over and over, whereas if it was a Commission matter the moneys or profits, if there were any, would go into the Treasury of the United States, and then could only be gotten out again by act of Congress, and it would create a charge that would not be a fair charge all the time, because the money would keep going in; whereas the other way we could turn it over and not have so much money involved.

Senator KITTREDGE. Who took part in the discussion of the reasons that induced you to make this contract with the railway company instead of with the Commission?

Mr. SHONTS. The gentlemen I just named.

Senator KITTREDGE. Judge Magoon?

Mr. SHONTS. It was on the Isthmus where we were talking this over. Governor Magoon and General Ernst were there and Mr. Stevens was there.

Senator KITTREDGE. What, if any, action did the railway company take in this matter?

Mr. SHONTS. When I came up, I took the matter up here. The board did not meet until after this had been done, but I spoke to

some of the other members of our Commission; I do not remember just who, Senator, but they all agreed to it.

Senator MORGAN. Was that a regular meeting of the board?

Mr. SHONTS. No, sir; you see the members of the Commission are directors of the railway.

Senator MORGAN. I know; you conferred with them?

Mr. SHONTS. Yes, sir; I make that a rule. I want to say generally that I make it a rule to talk these matters over in place of calling formal meetings at the office in New York. We have to hold the railroad directors' meetings in New York; but, because the directors of the railroad are also members of the Commission, I keep in touch with them on these various subjects here, and know how they feel, and we go ahead and act, and confirm it at the first formal meeting.

Senator KITTREDGE. Was any record made upon the books of the company?

Mr. SHONTS. Prior to the——

Senator KITTREDGE. Prior or subsequently?

Mr. SHONTS. Oh, yes. This whole thing was gone over by the board of directors.

Senator KITTREDGE. When?

Mr. SHONTS. I think no action was taken by the full board until we reported both the letting and the cancellation of the contract, and the settlement with Mr. Markel was then taken up and authorized.

Senator KITTREDGE. Then, so far as the records of the Panama Railway are concerned, there is no record upon its books prior to November 8, 1905?

Mr. SHONTS. No, sir; that is, as I recollect it.

Senator KITTREDGE. And at that date you authorized the payment of the moneys to Markel, in accordance with your previous testimony?

Mr. SHONTS. Yes, sir.

Senator KITTREDGE. Is that it?

Mr. SHONTS. That is as I recollect it.

Senator KITTREDGE. At the time this Markel claim was presented was there anything before you operating as a basis for your action except Markel's communications?

Mr. SHONTS. The first time that the question of compensating Markel was mentioned, as I recollect it, was the morning in Mr. Smith's office in Panama, when Mr. Stevens and Governor Magoon and I, Mr. Smith being present, decided to take advantage of the clause permitting us to cancel the contract, and canceled it.

Senator TALIAFERRO. Mr. Shonts, was that the first reference that was made, you say, to the cancellation?

Mr. SHONTS. No; that was the first reference that was made to the compensation, as I recollect it, Senator.

Senator TALIAFERRO. Yes.

Mr. SHONTS. And when we got through with our discussion, and I heard Mr. Stevens's views and Mr. Smith's views and Governor Magoon's, I said then: "I think we should cancel the contract, and I will so notify Mr. Markel." And then Mr. Stevens spoke up and said: "Markel has been down here; he has done a great deal of work for us, which we have got the benefit of, prior to the time we

thought about a contract, and I have thought we should compensate him for his services to us as an expert." Governor Magoon coincided with that view, and I said I thought it was only fair; so, when I notified Mr. Markel that we had decided to cancel the contract, I told him that we would pay him what was fair and right, and would like to have him present a statement of his expenses, and so forth.

Senator MORGAN. Was Mr. Stevens at that time a director in the railroad?

Mr. SHONTS. No, sir; he was not.

Senator MORGAN. He never has been?

Mr. SHONTS. Yes; he is now.

Senator MORGAN. But at that time he was not?

Mr. SHONTS. No, sir.

Senator MORGAN. In your personal conference with the members of the board of directors did you confer with anybody except the Commissioners who were on that board?

Mr. SHONTS. Only with people that I had access to here in Washington, Senator.

Senator MORGAN. I believe you stated when you were here before, or somebody else stated, that Mr. Cromwell drew up the contract?

Mr. SHONTS. No. I do not think I stated that, Senator.

Senator MORGAN. That was not you? It was somebody else?

Mr. SHONTS. I do not think I stated it.

Senator MORGAN. Do you know who did draw it?

Mr. SHONTS. Before you came in, I said a while ago, that the man that did the most of the work was Mr. Ross, with Mr. Charlton's assistance. He is the attorney for the Insular Bureau.

Senator MORGAN. In those consultations did you confer with any of the directors of the railroad who were not members of the Isthmian Canal Commission?

Mr. SHONTS. I do not remember of doing so, Senator.

Senator MORGAN. The members of the Isthmian Canal Commission were in the majority on the board?

Mr. SHONTS. I think they are; yes.

Senator MORGAN. And you conferred with all of those?

Mr. SHONTS. I think so; all that were here. I do not remember just who I talked to, Senator; but I know that was my general policy, to keep in touch on all important matters with all of the members of the Commission here, to get their views informally. I do it to save time only.

Senator MORGAN. You did not confer with the minister from Panama, Mr. De Obaldia, who is a director, or was a director then?

Mr. SHONTS. I think he was a director, but I did not consult with him.

Senator MORGAN. Have you ever consulted with him about anything?

Mr. SHONTS. No, sir.

Senator MORGAN. Why do you ignore him?

Mr. SHONTS. It is not through any intention to ignore him, it is because of the inconvenience of seeing him informally. When we have a board of directors' meeting formally he has his notice, and then we are very glad to have his views.

Senator MORGAN. He was present?

Mr. SHONTS. At the meeting in New York?

Senator MORGAN. Yes.

Mr. SHONTS. Yes, sir.

Senator MORGAN. He did attend?

Mr. SHONTS. I think so. I am not sure about that, but I think so. Anyhow, he had his notice.

Senator MORGAN. You are not certain that he ever did attend any meeting?

Mr. SHONTS. Yes; he did attend. I do not know how many, but he has attended meetings.

Senator MORGAN. He has conferred with you about the business?

Mr. SHONTS. He has sat with the directors and had his say.

Senator MORGAN. You considered that the business of the United States, did you not?

Mr. SHONTS. Which was that, Senator?

Senator MORGAN. These conferences about this management by the railroad.

Mr. SHONTS. Oh, yes, sir.

Senator MORGAN. So that here was a foreign officer representing his Government at our court, who was also an officer of the United States conferring with the balance of the directors in regard to the business of the Government in conducting this railroad. Was that a fact?

Mr. SHONTS. He is a director. Minister De Obaldia is a director of the railroad, and when he sits in the meetings of the railroad directors of course he has his say.

Senator MORGAN. Yes; of course he has. I suppose he is a very able man, is he not?

Mr. SHONTS. I have not had an opportunity to judge as to his abilities. I understand he is considered a very able man.

Senator MORGAN. As a diplomatist or as a railroad man?

Mr. SHONTS. I have not analyzed his reputation, Senator.

Senator MORGAN. I am not asking for amusement, but to get the facts.

Mr. SHONTS. I understand that he is a very able man, but I have not had very great business relations with him, Senator, personally.

Senator MORGAN. Would you select him as a railroad man competent to conduct the business of a railway?

Mr. SHONTS. I have not had an opportunity to discover whether he is an able railroad man or not.

Senator MORGAN. Have you ever heard that he was?

Mr. SHONTS. No, sir; I never heard that he was.

Senator MORGAN. Proceed, then.

Senator TALIAFERRO. Have you ever read the charter of the Panama Railway Company?

Mr. SHONTS. I do not think I have.

Senator TALIAFERRO. Do you know whether there is anything in the charter of that company authorizing the company to go into the business that you have gone into in connection with this work on the canal?

Mr. SHONTS. I do not know that. I do know that they were operating railroads and commissaries for years.

Senator TALIAFERRO. For their own employees, or outside of their own business?

Mr. SHONTS. I do not know that they limited their commissaries to their own employees.

Senator TALIAFERRO. So that you made this contract with Mr. Markel without really knowing whether you had any legal authority to do it or not?

Mr. SHONTS. We had the advice of this counsel that I spoke of.

Senator MORGAN. Who was that?

Mr. SHONTS. Mr. Charlton.

Senator MORGAN. Anybody else?

Mr. SHONTS. No.

Senator MORGAN. Where was the chief counsel?

Mr. SHONTS. Who was that?

Senator MORGAN. Mr. Cromwell.

Mr. SHONTS. He was in New York. I am speaking of the preparation of the specifications.

Senator MORGAN. I know.

Mr. SHONTS. Judge Charlton was the lawyer that we asked to help us, because he was in charge of the insular affairs.

Senator TALIAFERRO. Is not Mr. Cromwell the attorney for the railroad company?

Mr. SHONTS. Yes, sir.

Senator TALIAFERRO. Why did you not consult your own attorney?

Mr. SHONTS. This whole thing was done under stress of what we supposed was great urgency, and we were using every means on earth to get it done as promptly as possible.

Senator TALIAFERRO. Regardless of the law?

Mr. SHONTS. Not regardless of the law, or else we would not have gotten Mr. Charlton as a legal adviser. We supposed we were having proper legal advice.

Senator TALIAFERRO. I mean no reflection on Mr. Charlton. I do not know him at all.

Coming back to that contract a minute, Mr. Shonts, I would like to have you refresh your memory on it and be quite satisfied of your answer, now, to this question:

When you considered those bids and afterwards made a contract with Mr. Markel, did you not, as a matter of fact, base the whole thing on the monthly charges for the gold and silver employees?

Mr. SHONTS. No, sir.

Senator TALIAFERRO. Do you assert that positively?

Mr. SHONTS. Oh, yes.

Senator TALIAFERRO. Do you remember the circumstances with sufficient clearness to make that statement positive and unqualified?

Mr. SHONTS. Yes; I remember one instance that will make it positive and unqualified, and that is——

Senator TALIAFERRO. I do not care for the instance if you are satisfied.

Mr. SHONTS. Yes.

Senator TALIAFERRO. Then I want you to explain this cablegram that you sent to Mr. Stevens.

Mr. SHONTS. Yes.

Senator TALIAFERRO (reading): "Hotel contract closed with Markel to-day, basis 30 and 12 a month gold and silver, respectively."

Mr. SHONTS. Yes; that was just an indication of what the basis was. I did not think it was necessary to put the Government to the

expense of cabling Mr. Stevens the entire prices for each class of meals furnished. I thought that would give him an idea of the prices.

Senator TALIAFERRO. You took that as a basis?

Mr. SHONTS. I took that as an illustration.

Senator MORGAN. Will you allow me to interpolate a matter that has just occurred to me, that I wanted to ask him about before?

Senator TALIAFERRO. Certainly.

Senator MORGAN. You have explained about the expense to the Government of cabling. Is it not an indispensable requisite to the conduct of the work on the canal that the Government should have its own cable?

Mr. SHONTS. I think so, Senator.

Senator MORGAN. Connecting this continent at the shortest points with Colon?

Mr. SHONTS. I think so, and I have strongly urged that.

Coming back to your question, Senator Taliaferro, I have tried to limit, by cautioning our heads of departments, the amount of our cable service as much as possible. And one result of being brought up on small roads that do not have any extra money to spare is that I have always been personally very careful about telegraph bills.

Senator TALIAFERRO. But if you sent a cablegram to Mr. Stevens that you found was not fully understood by Mr. Stevens, in repeating it you would enlarge it sufficiently so that he might understand it?

Mr. SHONTS. Certainly.

Senator TALIAFERRO. Well, then, let us explain this.

Mr. SHONTS. All right.

Senator TALIAFERRO (reading). "Upon receipt of this, Mr. Stevens replied as follows:

"If contract with Markel means to charge \$30 per month for board gold men as against present charge, it means serious trouble here, and probably equivalent increased salaries."

"To which an immediate reply was sent to Mr. Stevens as follows:

"Markel's bid was lowest. Rate mentioned for gold employees contemplates high-class meals. Will arrange for good but more simple meals at lower prices for those who want them."

Mr. SHONTS. Yes.

Senator TALIAFERRO. Why did you not, in that answer to Mr. Stevens, make it clear to him that you were not confining your estimate of those bids merely to the gold and silver men per month?

Mr. SHONTS. Because I knew that what he said there was no doubt true. Having been on the Isthmus recently and having known the amount of demoralization that existed, I realized where the trouble was—knowing that we were only charging them \$22.50 for meals and \$2.50 for rooms—that that was a big price.

The question in my mind all the time in the preparation of menus was whether we were not getting them too good; and the question that I did not bring out in the specifications, but thought about, was whether we should not have two classes of meals. For instance, so that the mechanics could have substantial meals, but not quite so elaborate as the clerks and the others. I used these two figures as illustrations, not quoting the whole thing. I did not think it was necessary. I answered back supposing that that would help him out of his difficulty with the men, if we had another class of gold meals

that would be less expensive and less elaborate. I was confining my telegram to what I thought was the gist of the situation.

Senator TALIAFERRO. This is the letter, Mr. Shonts, addressed by you to the chairman of this committee, and I wish to read it and put it in the record as showing that at the time you wrote this letter, February 26, 1906, you made no suggestion that, in considering these bids, you had used any other basis than the monthly charges for the gold and silver men as put in these two bids.

Mr. SHONTS. I did not suppose that issue was up, Senator.

Senator TALIAFERRO (reading):

" FEBRUARY 26, 1906.

" MY DEAR SENATOR: I have your letter of February 22, stating that you have been furnished an abstract of the cost of feeding the gold and silver employees on the Isthmus covering a period of three or four months, and in which you also request that you be furnished with a copy of a cablegram from Chief Engineer Stevens 'stating that in his opinion the prospective profits to Mr. J. E. Markel from a contract which he had entered into with your Commission would amount to something like \$1,000,000 a year.'

" The official cable files show that when the contract was entered into with Mr. Markel a cable was sent to the Isthmus as follows:

" 'Hotel contract closed with Markel to-day, basis thirty and twelve a month gold and silver, respectively.'

" Upon receipt of this Mr. Stevens replied as follows:

" 'If contract with Markel means to charge \$30 per month for board gold men as against present charge, it means serious trouble here, and probably equivalent increased salaries.'

" To which an immediate reply was sent to Mr. Stevens, as follows:

" 'Markel's bid was lowest. Rate mentioned for gold employees contemplates high-class meals. Will arrange for good but more simple meals at lower price for those who want them.'

" Mr. Stevens did send me a cablegram setting forth for my information his personal views on this subject, in which he did express the opinion that the contract would afford Markel an excessive profit. It very soon developed, however, that the many factors entering into this matter made it clear that only the future could tell the outcome of this contract.

" You are, however, familiar with the conditions leading to the abrogation of this contract, and, as you say, you have been furnished with the actual figures of cost under Government supervision. It is fair to assume that even in the hands of the most economical concessionaire these Government costs could not be so very materially decreased.

" The cable in question, being of a personal and confidential character, was never placed in the files of the office, and I am unable to locate the same at this time. If, however, the matter is of any great moment I assume a copy might be obtained by correspondence with the cable company.

" Very truly, yours,

T. P. SHONTS.

" Hon. J. H. MILLARD,

" *Chairman Committee on Interoceanic Canals,*
" *United States Senate, Washington, D. C."*

I wish to ask you a question or two about that, but I will take the matter up after recess.

(The committee thereupon took a recess until 2.15 o'clock p. m.)

AFTER RECESS.

The CHAIRMAN. Senator Taliaferro, will you proceed?

Senator TALIAFERRO. Mr. Shonts, when you were negotiating these contracts you were acting as chairman of the Commission?

Mr. SHONTS. Yes, sir; as well as president of the railway.

Senator TALIAFERRO. And when you came up to the execution of the contract with Mr. Markel you were acting as chairman of the board of directors?

Mr. SHONTS. I was both of them all the time, Senator.

Senator TALIAFERRO. I speak of your correspondence, your discussions of the details of these contracts. Your correspondence seems to have been as chairman of the Commission.

Mr. SHONTS. Well, I do not always differentiate in my correspondence. I presume I technically ought to. I have used the words "Commission" and "railroad" indiscriminately. I know that.

Senator TALIAFERRO. When you were considering the bids of Hudgins & Dumas, as compared with the Markel bid, did you take into consideration their bid as follows: "We have sought to present a schedule of prices which will yield a net return of 6 per cent, and we are willing to interpolate in the contract a stipulation limiting profits to this amount, binding ourselves to disburse at the end of each year for Christmas festivities, for the creation or assistance of an amusement fund, or for such other purposes as the Commission may determine any surplus above a net return of said 6 per cent."

Mr. SHONTS. Yes, sir; I considered that.

Senator TALIAFERRO. Did you realize in considering that offer that they had everything to lose and nothing to gain by it?

Mr. SHONTS. I thought in considering that offer, in connection with the prices in their original bid, that they were laboring under a misapprehension, and that they were going to lose money, and in place of having anything to distribute the railroad company would have a deficit. Long ago I learned that a fellow that expects something for nothing in this world has got a bad job on his hands. I made a contract to build a railroad once under a bond, and a good bond, at a price that I felt it could not be done for, and that it would not be done for, and it cost us, before we got through with it, a great deal more money than if we had paid a higher price in the first place. That was the risk that I thought those people were running when they made that offer.

Senator TALIAFERRO. You did not consider that that offer applied to their amended proposition?

Mr. SHONTS. Well, I supposed that it applied to their amended proposition.

Senator TALIAFERRO. Did you think they would lose money by their amended proposition?

Mr. SHONTS. No; I did not think that they would; but I was not so much impressed with that feature of their bid as by the prices and the work that was to be required of them.

Senator TALIAFERRO. In this letter of February 26 to the committee I want to call your attention to the language again, Mr. Shonts: "Hotel contract closed with Markel to-day; basis \$30 and \$12 a month gold and silver, respectively." Was not that really the basis?

Mr. SHONTS. That was the basis for the gold and silver per month. That was not the basis for any of the rest of the prices.

Senator TALIAFERRO. You say it was the basis upon which the contract was closed?

Mr. SHONTS. I used that as an illustration, as I explained this morning. It might have been better if I had quoted the whole thing, but I did not think it was necessary. I thought that would give an idea.

Senator TALIAFERRO. In other words, you cabled to Mr. Stevens a statement that you did not have in mind when you closed the contract? In other words, you cabled to Mr. Stevens the statement that \$30 and \$12 constituted the basis of that contract, whereas you had in mind a different basis when you closed it?

Mr. SHONTS. No; I used that illustration of each class of labor.

Senator TALIAFERRO. You stated it concisely as a fact.

Mr. SHONTS. It was a fact as far as it went.

Senator TALIAFERRO. I think it was a fact, too, Mr. Shonts. I am not going to quarrel with you on that point. And when he asked you for particulars, you still used the \$12 and \$30 as the basis of that contract in your second cablegram to him and referred to nothing whatever beyond the \$30 and \$12.

Mr. SHONTS. That is right.

Senator TALIAFERRO. Except to suggest—

Mr. SHONTS. A cheaper menu for the gold, in addition to the present one.

Senator TALIAFERRO. That is a condition subsequent, however, to the execution of the contract. Mark you, you have closed the contract.

Mr. SHONTS. Yes.

Senator TALIAFERRO (reading): "Will arrange for good but more simple meals at lower price for those who want them."

Mr. SHONTS. Yes.

Senator TALIAFERRO. Did you ever make that arrangement?

Mr. SHONTS. Yes.

Senator TALIAFERRO. Subsequent to the execution of the contract?

Mr. SHONTS. Yes, sir; I telegraphed—I did not do it, but my office telegraphed—and this you could get probably from the man in charge of my office who did the telegraphing—

Senator TALIAFERRO. I want simply the best of your recollection.

Mr. SHONTS. I did not do it myself. I am trying to keep in line with what you stated this morning, as to what I did not do myself. As I remember it, my office telegraphed Mr. Markel wanting to know if he would arrange a cheaper menu for the gold men, as an addition, and he said that he would; and that was the basis of that cablegram. I did not send that cablegram personally, but it was sent by my office. That is my recollection.

Senator TALIAFERRO. Have you any evidence that he did provide any cheaper rate?

Mr. SHONTS. The contract never went into effect.

Senator TALIAFERRO. But when he went down there to put it into effect?

Mr. SHONTS. It did not get that far.

Senator TALIAFERRO. It did not get that far? Did he not go down there to the Isthmus with you?

Mr. SHONTS. Yes, sir.

Senator TALIAFERRO. Was not his purpose to put his contract into effect when he got there?

Mr. SHONTS. Yes, sir.

Senator TALIAFERRO. Well, then, he did go down to put his contract into effect?

Mr. SHONTS. Certainly; but I said it did not go to the point of going into effect.

Senator TALIAFERRO. Yes; but before it reached the point of going into effect, had you made the arrangement with him that you spoke of in this cablegram to Mr. Stevens for a lower rate?

Mr. SHONTS. My office had, as I am told and believe, corresponded with him by telegraph, and received his promise that he would make a cheaper menu for the other class of gold employees that did not want to pay for the better menu.

Senator TALIAFERRO. I simply want to know now, Mr. Shonts, if he ever made a cheaper menu?

Mr. SHONTS. No, sir; it was never carried into effect. It would have been done, I suppose, if we had gone on with that contract; but not doing so, it stopped right there.

Senator TALIAFERRO. I wish to introduce, Mr. Chairman, that comparative statement that I presented yesterday, and which by some oversight did not get into the record.

The CHAIRMAN. Yes; I looked for it in the record, and wondered why it was not put in.

(The following is the statement referred to, which was inadvertently omitted from yesterday's record:)

Year.	J. E. Markel.			Hudgins & Dumas.		
	Number and kind of men.	Yearly earnings on gold men at \$36 per month.	Yearly earnings on silver men at \$12 per month.	Yearly earnings on gold men at \$36 per month.	Yearly earnings on silver men at \$9 per month.	Difference, favor of.
First	Gold, 300	\$129,600		\$126,000		\$3,600
	Silver, 1,000		\$144,000		\$108,000	36,000
Second	Gold, 600	259,200		252,000		7,200
	Silver, 2,000		288,000		216,000	72,000
Third	Gold, 900	388,800		378,000		10,800
	Silver, 5,000		720,000		540,000	180,000
Fourth	Gold, 900	388,800		378,000		10,800
	Silver, 5,000		720,000		540,000	180,000
Fifth	Gold, 900	388,800		378,000		10,800
	Silver, 5,000		720,000		540,000	180,000
		1,555,200	2,592,000	1,512,000	1,944,000	
			1,555,200		1,512,000	
			4,147,200		3,456,000	
			3,456,000			
Total			691,200			691,200

The CHAIRMAN. Senator Taliaferro, perhaps it is just as well to put this in at this point. This is a letter from the auditor of the Commission, under date of February 21. I think it had better go

in the record. It is in reference to the cost of feeding of people at the Isthmus at the present time, or what it has been. Besides that there is here a comparative statement of the bids of the three parties bidding in reference to the food. I think those should all go in the record, and I will hand them to you to see if you have any objection. They are some figures that have been prepared, and I think they should both be in the record.

(The papers referred to are as follows:)

ISTHMIAN CANAL AFFAIRS, OFFICE OF ADMINISTRATION,
Washington, D. C., February 21, 1906.

SIR: Referring to your verbal request that I render a statement showing operations of our hotels and mess kitchens, and telephone conversation with one of the clerks of your committee this date, I inclose you herewith memorandum of net results of operations of hotels and mess kitchens to December 31, 1905, "subject to correction by further charges for expenses." We have undertaken to make up this statement based on the charges that would have been incurred by a contractor, in so far as we have incurred such expenses, and it is possible that there are some small items of expense that have not been included; hence I have made the statement up subject to further charges if they should develop, the matter now being under investigation.

The statement covers the operations of the eating part of the hotels only, and does not include any receipts or expenses for care of rooms, which information I have cabled the Isthmus for, and will submit to you as soon as received. You will note that I have shown the operations of the hotels and mess kitchens separately, the former being patronized by the white employees and the latter by the colored. I have also divided the statement into two periods, the second period, from November 1 to December 31 (during which time all of the hotels were in operation, the seven hotels operated having been opened at various dates between August 15 and November 1), showing a better result for the hotels than the prior period and a poorer result for the mess kitchens.

Following is a summary of the gross and net results for both:

	Gross receipts.	Expenses, excluding equipment.	Net loss, exclusive of equipment.	Net gain, exclusive of equipment.	Average cost per meal.
Hotels	\$80,674.89	\$44,870.78	\$14,195.89	.....	\$0.42
Mess kitchens	26,111.87	22,188.58	.....	\$3,958.29	.064
Total	56,786.76	67,024.36	16,744.93	.....
Adding cost of equipment .....	.....	.....	6,507.33	.....
Total loss, including equipment .....	.....	.....	23,252.36	.....

Respectfully,

E. S. BENSON, *General Auditor.*

Hon. J. H. MILLARD,

*Chairman Committee on Interoceanic Canals,
United States Senate, Washington, D. C.*

INVESTIGATION OF PANAMA CANAL MATTERS.

1401

ISTHMIAN CANAL COMMISSION.

*Memorandum of net results of operations of hotels and mess kitchens to
December 31, 1905.*

[Subject to correction by further charges for expenses.]

HOTELS.

Period to October 31, 1905.

Gross receipts	\$12,370.29
Operating expenses	21,335.31
Net loss, exclusive of equipment	8,965.02
Number of meals furnished	44,752
Average cost per meal	\$0.48

Period November 1 to December 31, 1905.

Gross receipts	\$18,304.60
Operating expenses	23,535.47
Net loss, exclusive of equipment	5,230.87
Number of meals furnished	62,124
Average cost per meal	\$0.37

Both periods.

Gross receipts	\$30,674.89
Operating expenses	\$44,870.78
Net loss, exclusive of equipment	\$14,195.89
Cost of equipment	6,138.39
	51,009.17
Net loss, including equipment	20,334.23
Number of meals furnished	106,876
Average cost per meal, exclusive of equipment	\$0.42
Average cost per meal, including equipment .....	.47 $\frac{1}{2}$

MESS KITCHENS.

Period to October 31, 1905.

Gross receipts	\$20,222.48
Operating expenses	16,286.04
Net earnings, exclusive of equipment	3,936.44
Number of meals furnished	202,224
Average cost per meal	\$0.08 $\frac{1}{2}$

Period November 1 to December 31, 1905.

Gross receipts	\$5,889.39
Operating expenses	5,867.54
Net earnings, exclusive of equipment	21.85
Number of meals furnished	58,898
Average cost per meal	\$0.10

Both periods.

Gross receipts.....	\$26, 111. 87	
Operating expenses.....	\$22, 153. 58	
Net earnings, exclusive of equipment.....		\$3, 958. 29
Cost of equipment.....	368. 94	
	22, 522. 52	
Net earnings, including equipment.....		3, 589. 35
Number of meals furnished.....		261, 117
Average cost per meal, exclusive of equipment.....		\$0. 08 ¹⁷ / ₁₆
Average cost per meal, including equipment.....		. 08 ¹⁷ / ₁₆

RECAPITULATION.

	Exclusive of equipment.	Including equipment.
Hotel loss.....	\$14, 195. 89	\$20, 334. 28
Mess kitchen profit.....	3, 958. 24	3, 589. 35
Net loss.....	10, 237. 65	16, 744. 93

E. S. BENSON, *General Auditor.*

FEBRUARY 21, 1906.

Abstract of bids for hotel and mess privileges.

GOLD EMPLOYEES.

	Hudgins & Thomas.	J. E. Markel.	H. Balfe & Co.
Meals per month per person over—			
12 years of age.....	\$30. 00	\$30. 00	\$45. 00
5 and under 12 years of age.....	20. 00	10. 00	15. 00
Meals per day per person over—			
12 years of age.....	1. 25	1. 00	1. 88
5 and under 12 years of age.....	. 75	. 40	. 75
Meals per meal per person over—			
12 years of age.....	. 50	. 33 ¹ / ₄	a. 50
5 and under 12 years of age.....	. 30	. 13	b 1. 50
Maintenance and care of rooms per month per person over—			
12 years of age.....	5. 00	6. 00	c. 50
5 and under 12 years of age.....	3. 00	No charge.	d 7. 50
Maintenance and care of rooms per day per person over—			
12 years of age.....	. 50	. 20	e 5. 00
5 and under 12 years of age.....	. 30	No charge.	. 75
			d. 35
			e. 25

SILVER EMPLOYEES.

Meals per month per person over—			
12 years of age.....	\$9. 00	\$12. 00	\$12. 00
5 and under 12 years of age.....	6. 00	5. 00	5. 00
Meals per day per person over—			
12 years of age.....	. 50	. 45	. 45
5 and under 12 years of age.....	. 30	. 20	. 17
Meals per meal per person—			
Over 12 years of age.....	. 20	. 15	a. 12
Under 12 years of age.....	. 20	. 10	b. 20
			c. 15
			. 09

a Breakfast.
b Dinner.
c Supper.

d When occupied by 1 person.
e When occupied by 2 persons.

Mr. SHONTS. Can I say one thing in regard to those figures—what it is costing us to feed the men down there?

Mr. TALIAFERRO. Yes, sir.

Mr. SHONTS. I want to be fair to everybody about these things. You will notice in those figures that as they are made up here, covering the period from the time we commenced until October 31, the cost for the gold men was 48 cents per meal, and in November and December it was 37 cents. Now, I will call your attention to the decrease.

The CHAIRMAN. Mr. Shonts, I take it that the figures you have there are the same as those that the stenographer has, because I received them from your office?

Mr. SHONTS. They were made up by Mr. Benson, were they?

The CHAIRMAN. Yes.

Mr. SHONTS. He made them, I suppose.

Senator TALIAFERRO. We are just putting them in the record now.

Mr. SHONTS. I just wish to make an explanation, that is all. Now, since then, while we have not gotten the report for January, I have a letter from Mr. Stevens saying that as they get more into the swing of it they are reducing the cost.

Now, the mess kitchens, on the other hand, for the period ending October 31 cost 8.1 cents, while for the next two months they cost 10 cents, an average of 8.5. The average on the other item was 42.

The CHAIRMAN. You mean, that is, 8.1 cents a meal?

Mr. SHONTS. Yes, sir.

The CHAIRMAN. For a meal?

Mr. SHONTS. For a meal; and for November and December that rose to 10 cents a meal for the silver men. For the gold men, up to October 31, it was 48 cents a meal, and for November and December, 37, showing a decrease, as they got the thing going smoother. Now, inasmuch as I wrote Mr. Stevens what these figures were, or, rather, as he gets a copy of these statements that are made up down there, he wrote me a letter saying that January would make a still better showing, and that they were getting the thing running smoother, and he hoped to be able to "break even." Of course to-day, when these figures were made up, it is costing the Commission money.

That is the only explanation I wanted to make, as being fair to Mr. Stevens, who is handling the matter down there.

Senator TALIAFERRO. Have you gentlemen worked out these improved conditions down there as difficulties have occurred, and as you have seen how you could handle the feeding most economically and best?

Mr. SHONTS. Well, you know, we started in with every person green on the subject, and, of course, they get more expert as they go on. They see where they can save here and there; and they are, of course, doing everything they can to satisfy the men and at the same time do it as cheaply as possible.

Senator TALIAFERRO. You have adopted no fixed plan down there, except it possessed elasticity enough for you to improve it as you saw the opportunity to improve it?

Mr. SHONTS. Oh, yes; that is true.

Senator TALIAFERRO. For instance, Mr. Markel laid down no line that you have followed?

Mr. SHONTS. He did lay down lines that we have followed; yes.

Senator TALIAFERRO. Did he lay down any lines different from those that were there before he went?

Mr. SHONTS. There was nothing there. He established the mess houses and all this silver business; that was not there at all. He located the commissaries and gave us his ideas about their operation, which were followed out. We had the two hotels that we had leased; we are operating them ourselves. Now, of course, our men that undertook to do those things were not trained men, but they are getting more skillful, and, as Mr. Stevens writes, we are getting the prices gradually lower.

Senator MORGAN. You have stated to-day, if I understand you correctly, and I do not know that I do, that you are holding in reserve the question of your continued service with the Canal Commission, and if it is necessary for you to continue in service that you should abandon your presidency, or your control, or whatever it may be, in the Clover Leaf road. You are holding that in reserve?

Mr. SHONTS. I did not mean to state it just as you have stated it, Senator.

Senator MORGAN. How do you mean to state it?

Mr. SHONTS. The President sent for me and told me the question of my drawing a salary as president of the Clover Leaf was up, and he wanted to know how I felt in regard to continuing it. I said that in view of my nominal duties with the Clover Leaf it seemed to me that the persons that ought to object were the other people associated with me in the Clover Leaf Railroad, and that they had not objected. He said: "I am afraid that this is going to be an embarrassing feature." I said: "I do not want to embarrass you, and if it becomes necessary I will drop the salary."

Senator MORGAN. You mean the salary from the Clover Leaf?

Mr. SHONTS. Yes, sir. So he said: "I think you should have a reasonable time. In the meantime," he said "what are you trying to do in regard to the property?" I said: "I shall be very glad to dispose of my holdings, if I could do it without too great a sacrifice." And he said: "You should have a reasonable time to see what you can do with it." And he said: "How long?" I said: "Say three or four months;" and that is the way it was left. The question of my giving up my holdings of the Clover Leaf never has been up.

Senator MORGAN. The President has never demanded that you should do it?

Mr. SHONTS. No; not that I should sell my holdings. As I explained—

Senator MORGAN. Or that you should give up what you call your nominal control there? The President has never demanded that of you at all?

Mr. SHONTS. No, sir; it was a question of salary that he spoke to me about.

Senator KITTREDGE. When was that conversation?

Mr. SHONTS. As nearly as I can remember, Senator, it was about the middle of January.

Senator MORGAN. So that you hold yourself at liberty to decline the commissionership of the canal if you choose to do it?

Mr. SHONTS. I had not thought of it in that way, Senator.

Senator MORGAN. Do you feel that you are at liberty to do it or not?

Mr. SHONTS. I became connected with this work at the request of the President of the United States. He promised me certain things when I came, and as long as he wants me, and those promises are kept, I shall be very glad to stay and do the best I can. If he does not want me of course I could not stay, and I would not want to stay; or, if my hands should be tied, so that I could not do what I think I ought to be in shape to do, I would not want to stay.

Senator MORGAN. What were those certain things that the President said to you about your rights or your duties in your position?

Mr. SHONTS. The President told me that I should have a free hand in carrying out his policies; that I should, after the type of canal was decided upon, create my own organization, and that he never would interfere with me himself in a way to cripple the work or permit others to do so; and that I could always depend on him for his sympathy and support, and he has always lived up to those promises splendidly.

Senator MORGAN. What did he mean by a free hand, as you understood it?

Mr. SHONTS. I understood that in the creation of the organization and the mapping out of the lines of work under the general type of canal that I should have a free hand in respect to those things.

Senator MORGAN. That is to say, that your recommendations would be given preference over those of anybody else?

Mr. SHONTS. Well, I suppose so, just the same as the head of any organization has, in connection with its board of directors.

Senator MORGAN. You were appointed as Commissioner?

Mr. SHONTS. Yes, sir.

Senator MORGAN. By the President?

Mr. SHONTS. Yes, sir.

Senator MORGAN. And after that conversation?

Mr. SHONTS. Yes, sir.

Senator MORGAN. Did you conceive that you had any greater rights or privileges or powers as Commissioner than anybody else that went down there in the same character?

Mr. SHONTS. I conceived that the President meant just what he said to me, and that while I would not have any more voice in voting, yet if I should appeal to the President and he should coincide with my views, that he would support me.

Senator MORGAN. That gave you some preeminence, to say the least of it, above the balance of them.

Mr. SHONTS. Well, the chairman probably has more prestige than the other Commissioners.

Senator MORGAN. Mr. Cromwell brought here the other day a part of a letter marked "Private and confidential," written by Mr. Wallace to you, and laid it before the committee. Have you ever seen that extract?

Mr. SHONTS. I have not read his evidence, Senator. I knew that he had quoted an extract.

Senator MORGAN. Did you furnish him a part of a private and confidential letter written by Mr. Wallace to you?

Mr. SHONTS. I received a private and confidential letter from Mr. Wallace.

Senator MORGAN. Yes.

Mr. SHONTS. And I put it in the files of the railroad.

Senator MORGAN. Yes.

Mr. SHONTS. I do not remember of furnishing him personally a copy of it; but he could get it——

Senator MORGAN. Did you furnish anybody else a copy that he could get hold of?

Mr. SHONTS. I gave Secretary Taft a copy of it.

Senator MORGAN. You gave the copy that he brought here to Secretary Taft?

Mr. SHONTS. I do not know that.

Senator MORGAN. You mean you do not know whether he brought it here or not?

Mr. SHONTS. No; I mean that I do not know where he got it. He may have gotten it out of the files of the Panama Railroad.

Senator MORGAN. But you gave a copy of a private and confidential letter to Secretary Taft for some purpose?

Mr. SHONTS. Because it is a part of the record. It was a part of the record.

Senator MORGAN. To be used for some purpose?

Mr. SHONTS. Not that I know of. I did not suppose it would.

Senator MORGAN. Did the Secretary inform you why he wanted a part of a private and confidential letter, written to you, copied out and handed to him?

Mr. SHONTS. He did not inform me that at all. As I recollect it, I did it voluntarily. I send to the Secretary of War's office a copy of all important communications.

Senator MORGAN. What induced you to copy out that part of a private letter and hand it to the Secretary of War?

Mr. SHONTS. I did not copy out any part. A copy of the whole letter was furnished.

Senator MORGAN. It was, then, Cromwell's selection, was it, and not yours?

Mr. SHONTS. I do not know about that.

Senator MORGAN. Do you know how Cromwell got hold of it?

Mr. SHONTS. No, sir.

Senator MORGAN. What right has he of access to the files of the Commission?

Mr. SHONTS. This was given to me in New York, and was in the files of the railroad office.

Senator MORGAN. The railroad office?

Mr. SHONTS. Yes, sir; I was in New York when I got that letter.

Senator MORGAN. Why did you put it in the files of the railroad office?

Mr. SHONTS. I say that is my recollection. I do not remember certainly. We make duplicate files, Senator, in the Commission files, of everything of importance that is in the railroad files pertaining to railroad matters of any kind. So that I suppose there was a copy of it in each file. I am not personally sure.

Senator MORGAN. Cromwell has furnished to the committee a full copy of that letter, on my requirement, and it is here. The letter from Mr. Wallace to you is dated, "Isthmian Canal Commission, New York, June 26, 1905." At that date Wallace was in New York?

Mr. SHONTS. Yes, sir.

Senator MORGAN. Was that the period of time when his resignation was given?

Mr. SHONTS. As I recollect it, that was on Monday that he wrote that letter, and he had resigned the Sunday before—the day before.

Senator MORGAN. The day before was the time that he and Secretary Taft and Cromwell had had that interview in the Manhattan Hotel?

Mr. SHONTS. Yes, sir.

Senator MORGAN. And this letter was written on Monday?

Mr. SHONTS. As I recollect it.

Senator MORGAN. I will read that to you if you will allow me. [Reading:]

[Personal and confidential.]

ISTHMIAN CANAL COMMISSION,
New York, June 26, 1905.

Mr. T. P. SHONTS,
*Chairman Isthmian Canal Commission,
Manhattan Hotel, New York City.*

MY DEAR MR. SHONTS: When I arrived in New York Thursday night I was told that you had left the city for Chicago and would not be back until the first of this week. I see by the papers this morning, however, that you were either in the background at the Manhattan yesterday or else came around the corner after I left the conference.

For various reasons my interview with the Secretary seemed very unsatisfactory—at least, to him—and resulted in my informing him that I would forward my resignation as chief engineer and Commissioner to the President through him to-day, subject to acceptance at the convenience and pleasure of the President, of course with the understanding that this meant the near future, if not immediately.

The business proposition that I have now under consideration is of such an important character and opens out such a wide field for future prosperity to me that I can not possibly see how I would be justified in declining it. My family and those of my friends with whom I have consulted with regard to it have been absolutely a unit in urging me to form the new connection.

There were so many sides to this matter that I thought it best for the Secretary of War and myself to discuss it in all its features and at length. I also did not feel that it would be fair to the Secretary to let the matter lie over until after he had left the country.

On the other hand, the situation was such that I would have had to let the opportunity go by if it had become necessary to postpone it until his return from the Philippines.

It is my desire, of course, to leave everything connected with the work in satisfactory shape, and I will do everything possible to assist you and the Secretary in arranging matters. At no time in the future could the change be made more advantageously than now, as the organization is all blocked out and in working order, and can be strengthened and expanded either slowly or rapidly, as may be desired, and in case arrangements are made that will put my counsel and advice at your command during the next few months there is no reason why the change should cause any particular delay or annoyance.

I have no other wish or desire than to bring about the change with the least annoyance and inconvenience to the Administration and yourself, and do not feel that I can be justly subjected to any criticism on account thereof, particularly as I have offered to give as much of my time in a consulting and advisory capacity as may be considered desirable, although you can readily understand that I would much prefer to have no further connection with the work, in order that my entire time can be given to my personal and business matters.

I write you this fully and confidentially, not as the chief engineer of the Commission, but as a personal friend and associate in this work, and would, of course, be pleased to have a conference with you wherever and whenever you desire, although I have personally kept away from public places, as I did not care to come in contact with representatives of the press until after all matters had been finally adjusted and my connection with the work terminated, as it seemed to me best for the interests of all that absolutely nothing should be given to the public press beyond the mere fact that I had resigned for personal and family reasons, in order to form business connections which I felt in justice to myself and family I could not decline.

As I said before, I am afraid the Secretary did not appreciate the fact that while I was determined to sever my connection I desired to leave my relations friendly and to do everything possible to prevent any embarrassment to the Administration or delay and injury to the work.

I desire to express to you my warm personal regard and my thanks for the kind and generous way in which you have treated me in all matters connected with the work, and to assure you that your personality had nothing whatever to do with the step that I am taking; in fact, in considering the questions from both sides, one of the strong inducements for me to remain was your pleasant personality and our warm personal friendship.

On the other hand, the probability of your being disconnected with this work, either in the near or immediate future, which seemed to come to me intuitively, and the probability of the position being filled by some man with whom I could not harmoniously act, was one of the strong inducements that controlled me.

As I have reported my presence in New York to the Secretary formally, and he understands the line of action which I will pursue, I will, of course, remain here until I receive further advice.

With kindest regards, I remain, very truly, yours,

JOHN F. WALLACE.

In putting this letter on the files either of the railroad company or the railroad—I call it a company still, because I suppose if it lives at all it lives as a company—or on the files of the Isthmian Canal Commission, did you mean to remove the confidence so that the world could get hold of what had been written to you by Mr. Wallace in confidence?

Mr. SHONTS. Well, I meant to put it so that it was a part of his relationship with the canal. It was not a letter that I had requested and I did not think because he had marked it personal and confidential that I had a right to take it out of the files.

Senator MORGAN. When did you put it on those files?

Mr. SHONTS. I suppose right away. I do not remember.

Senator MORGAN. Let us have some recollection about it, if you have any.

Mr. SHONTS. Well, I have not.

Senator MORGAN. You have not a bit?

Mr. SHONTS. No.

Senator MORGAN. Was it as much as a month after Mr. Wallace's resignation had been accepted?

Mr. SHONTS. I do not have any recollection about it at all.

Senator MORGAN. Was it after or before Mr. Wallace's resignation had been accepted that you put it on the files?

Mr. SHONTS. If I had any recollection I should be very glad to give it; but I do not remember a thing about that feature of it. I treated it as any other correspondence, as I recollect it.

Senator MORGAN. Did you feel at liberty to treat a private and confidential letter from a friend as you would any other correspondence?

Mr. SHONTS. Having such a bearing on so important a subject, in connection with public work, I thought that it ought to go on the records, Senator.

Senator MORGAN. Then, if that was your motive, it must have been put on the files after Mr. Wallace had made his resignation.

Mr. SHONTS. I do not have any recollection about it.

Senator MORGAN. Was it not bound to be so?

Mr. SHONTS. After he had resigned, certainly. He did not write it until after he had resigned. But I understood you to ask whether it was after or before his resignation had been accepted.

Senator MORGAN. No; after he had made his resignation.

Mr. SHONTS. Certainly; it was written after he had made his resignation.

Senator MORGAN. Was not that a part of the justification that was relied upon by Secretary Taft, at least, and by the associate commissioners in the rebuke that had been administered to Mr. Wallace in public for his resignation?

Mr. SHONTS. Oh, no; the rebukes—the session in New York was before he wrote the letter.

Senator MORGAN. I say, did you not put it on the files in order to justify the action that led to those rebukes?

Mr. SHONTS. I do not think there is anything in that that would justify those rebukes at all.

Senator MORGAN. I am not arguing it; I am trying to get the facts. What was your purpose and motive in putting it on the files?

Mr. SHONTS. Just what I tell you—that I did not believe because it had to do with so important a matter as his resigning that I should treat it as a personal matter.

Senator MORGAN. Did you put it there for the purpose of vindicating Mr. Wallace or for the purpose of vindicating Secretary Taft?

Mr. SHONTS. Mr. Senator, I did not put it there for either purpose. I just put it on the files because I thought it was my duty to put all matters pertaining to those things in the files.

Senator MORGAN. Have you ever put any other of your private and confidential letters in your files?

Mr. SHONTS. I do not know; I suppose I have.

Senator MORGAN. Do you know that you have?

Mr. SHONTS. No, sir; I do not know. I do not remember.

Senator MORGAN. If you had, would you not remember it?

Mr. SHONTS. No; not necessarily.

Senator MORGAN. Not necessarily? You do not deal as lightly as that with private and confidential correspondence, do you?

Mr. SHONTS. Not if it is private and confidential correspondence that I have encouraged; but we get letters marked private and confidential every day, Senator.

Senator MORGAN. Very likely.

Mr. SHONTS. And a lot of them are simply marked in that way so that they will get into the office.

Senator MORGAN. But you do not get them from close personal friends marked private and confidential every day, do you?

Mr. SHONTS. Yes; and they do not all go into the files, of course, because they do not all have to do with a great public question, as this had.

Senator MORGAN. Was it not your purpose in putting that private and confidential letter on the files to support Mr. Taft's contention in regard to Mr. Wallace's delinquency or dereliction in resigning his office? Was not that your purpose?

Mr. SHONTS. No, sir; that was not my purpose.

Senator MORGAN. Why not?

Mr. SHONTS. I will tell you why not. I do not think there is anything in there that does justify it.

Senator MORGAN. Justify what?

Mr. SHONTS. Justify Mr. Taft's talk to him, if that was the drift of your remark, as I understood your question.

Senator MORGAN. Let me see if I understand you. I do not think I do.

Mr. SHONTS. Perhaps I do not understand the question.

(By request, the stenographer repeated the question of Senator Morgan and the answer of the witness, as follows:)

"Senator MORGAN. Was it not your purpose in putting that private and confidential letter on the files to support Mr. Taft's contention in regard to Mr. Wallace's delinquency or dereliction in resigning his office? Was not that your purpose?"

"Mr. SHONTS. No, sir; that was not my purpose."

Senator MORGAN. That was not your purpose? What was your purpose?

Mr. SHONTS. Just what I tell you. I thought it was a letter having to do with his resignation, which was an important matter, and that I could not keep it in my own personal files, but that I should put it in the records, so that if it ever had any bearing, there it was.

Senator MORGAN. When was it that you made a copy of a part of that letter for the Secretary of War?

Mr. SHONTS. I never made a copy of a part of it.

Senator MORGAN. I so understood you to testify.

Mr. SHONTS. No, sir; I testified to the contrary; that I had made a copy of all of it.

Senator MORGAN. For the Secretary of War?

Mr. SHONTS. Yes, sir; the same as we do with all important matters in the office. I did not do it by any special instructions. In the case of all important matters a copy of the correspondence is made and sent to the Secretary, so that he will have a file in his office of all important matters bearing on the Canal Commission.

Senator MORGAN. When did you do that?

Mr. SHONTS. I do not remember.

Senator MORGAN. How long ago?

Mr. SHONTS. I do not have any idea.

Senator MORGAN. Was it a year ago?

Mr. SHONTS. I suppose it was done in the due course of the work in the office after it was filed.

Senator MORGAN. Has it not been done within the last month?

Mr. SHONTS. No, sir; not to my knowledge.

Senator MORGAN. Or the last week?

Mr. SHONTS. He asked for another letter within a reasonable time.

Senator MORGAN. Yes.

Mr. SHONTS. A second letter.

Senator MORGAN. Did you furnish that?

Mr. SHONTS. Yes; he asked for that.

Senator MORGAN. Did you furnish this at the same time?

Mr. SHONTS. I do not remember about this one. I do not think so. I think that was there. That is my recollection, Senator. I would not be sure about this thing.

Senator MORGAN. Did you have any conference with Cromwell about this?

Mr. SHONTS. About furnishing these things?

Senator MORGAN. And about the contents of that letter of Wallace to you?

Mr. SHONTS. I think that I told Mr. Cromwell one afternoon, when he called on me, that I observed that Mr. Wallace had testified that one of his reasons for resigning was friction with me. I said: "He wrote me a letter in which he said that one of his chief reasons for not resigning was our pleasant relations." I said, "I can not reconcile his two positions." I think that was the only conversation I had with Mr. Cromwell on the subject.

Senator MORGAN. Cromwell has testified to that conversation.

Mr. SHONTS. He did? I did not know it. I have not read his testimony.

Senator MORGAN. Did he then ask you for an extract from that letter?

Mr. SHONTS. No; he did not ask me for an extract from the letter.

Senator MORGAN. How did he get it?

Mr. SHONTS. I have no knowledge. I do not know. He may have gotten it from the Secretary of War.

Senator MORGAN. Has Cromwell access to the private papers of the Secretary of War?

Mr. SHONTS. I do not know. I do not suppose he has.

Senator MORGAN. If he has not, how did he get the extract?

Mr. SHONTS. I do not know, sir. I can not answer that question.

Senator MORGAN. You do not know?

Mr. SHONTS. No, sir.

Senator MORGAN. Well, it is quite a mystery; but I do not think I will follow it.

You have stated here to-day, on two occasions, the conversation that you had with the President about your retaining your position and your salary as a Commissioner in this Canal Commission and as

the president of it, and in both of those statements you have brought forward, or there has been brought forward, a matter of personal interest to you—the question of your salary from the Clover Leaf road, and the question of your interest in that road. I suppose you have large interests in that road?

Mr. SHONTS. I have pretty good holdings.

Senator MORGAN. Do they amount in value to \$1,000,000?

Mr. SHONTS. The par value of the stock is over that.

Senator MORGAN. A conversation seems to have occurred between you and the President as to what you would do in regard to releasing that salary and what you would do if you were required to give up your interest in that railroad in order to retain your position as a Commissioner.

Mr. SHONTS. I beg pardon; in regard to the salary only, not the question of what I should do in regard to giving up my interest in the railroad. That was not a condition. He asked me what I was doing, and I said I would be very glad, on account of having no time to give to it, to get rid of my holdings if I could do so without too great a sacrifice.

Senator MORGAN. Did the President have anything to say about your interest in a railroad of 400 and odd miles long, to the extent of more than \$1,000,000, and in connection with transcontinental lines that were in competition with the railroad at Panama?

Mr. SHONTS. Not a word.

Senator MORGAN. Nothing was said?

Mr. SHONTS. No, sir.

Senator MORGAN. Did you understand that that was an idea running through both your minds at the time you were discussing the question as to whether you might possibly not remain with the Commission?

Mr. SHONTS. We were not discussing the possibility of my not remaining with the Commission. We were discussing the question of whether I should not give up my salary with the railroad.

Senator MORGAN. Mr. Wallace in that letter to you says this (reading): "On the other hand, the probability of your being disconnected with this work, either in near or immediate future, which seems to come to me intuitively, and the probability of the position being filled by some man with whom I could not harmoniously act was one of the strong inducements that controlled me."

What did you understand him to refer to?

Mr. SHONTS. I have not any idea.

Senator MORGAN. You have no idea?

Mr. SHONTS. No idea whatever.

Senator MORGAN. You never had any conversation with him about a probability of that sort?

Mr. SHONTS. Never.

Senator MORGAN. You have no idea where he got that inspiration from?

Mr. SHONTS. No, sir; I never have. I have often wondered what he meant by it.

Senator MORGAN. You have often wondered what he meant by it?

Mr. SHONTS. Yes, sir.

Senator MORGAN. Do you wonder about it when you have questions asked you, not only by this committee, but also by the public press,

at least remarks made in respect of your attitude there, that after all it would be better if the president of the Clover Leaf Company and the holder of probably the largest amount of stock in it——

Mr. SHONTS. Oh, no.

Senator MORGAN. Well, the holder of a million dollars' worth of stock in it or more——

Mr. SHONTS. Over that, par value, yes.

Senator MORGAN (continuing). Would be considered as being incompatible with your relations to the Panama Railroad and the Canal Commission?

Mr. SHONTS. I do not know why it should be incompatible.

Senator MORGAN. You have seen the discussion, have you not?

Mr. SHONTS. I have seen something in the newspapers about it; yes, sir.

Senator MORGAN. Perhaps Mr. Wallace got his observations from that, and he seems to have read it. You do not suppose that Mr. Wallace, in speaking of the probability of your being disconnected from this work, was indulging in a mere imagination of his own?

Mr. SHONTS. Well, I think that he has an imagination. I do not know. I can not tell when a man writes me a letter how hard he is working his imagination.

Senator MORGAN. I will not stop to discuss or ponder in any way upon the probability, as to whether it was actual or not.

Mr. SHONTS. So far as I knew there was nothing in it, and I let it go at that. If I were to discuss what every fellow was dreaming about I would have my hands full.

Senator MORGAN. If the President of the United States at the time you were having this discussion about your being given a free hand, etc., had said to you: "Mr. Shonts, it is necessary for you to resign your presidency of the Clover Leaf road;" what do you think you would have said to him, with your state of mind as it was then?

Mr. SHONTS. I do not know what I would have said.

Senator MORGAN. Would you have said to him that you would prefer to adhere to your job rather than to take the chances of a new one?

Mr. SHONTS. I should probably have said that I would "rather bear those ills we have than fly to others that we know not of."

Senator MORGAN. Were you in that happy state of mind that you could not even reflect upon your own interests?

Mr. SHONTS. The question of my railroad connections was not discussed the day that I had my talk with the President.

Senator MORGAN. What would you have done if the President had said: "You must dispose of your holdings in that competitive railroad before you can be appointed as Commissioner?" What would you have said then?

Mr. SHONTS. I would have said that I bought those holdings and that property because it was run down and cheap, and I was trying to build it up and make it valuable. That sort of holdings you can not sell on the market. You have got to work your way out of it. And that would have probably ended the negotiations, if I could have disposed of them without too great a sacrifice. I do not know that I can yet, although the property has physically been——

Senator MORGAN. So that you were not in a state of mind which would lead you to a great sacrifice to get this position as Commissioner from patriotic motives, for the sake of the country?

Mr. SHONTS. Owing to the extent of the sacrifice——

Senator MORGAN. If it was a small one you might have been willing to do it; but if it was anything considerable you could not do it?

Mr. SHONTS. I want to be just to myself and my family. I think a man must be just to himself and his family.

Senator MORGAN. Mr. Wallace mentions that very consideration in this friendly letter that he wrote you?

Mr. SHONTS. Certainly.

Senator MORGAN. The interests of his family?

Mr. SHONTS. Certainly.

Senator MORGAN. And the wishes of his family?

Mr. SHONTS. Certainly.

Senator MORGAN. Had he not taken Mrs. Wallace down to that Isthmus for the first time shortly before he wrote you that letter?

Mr. SHONTS. I do not know about its being the first time. He had her down there.

Senator MORGAN. Did you ever see her there?

Mr. SHONTS. No, sir; I understood she was there?

Senator MORGAN. You had been there?

Mr. SHONTS. No, sir; I was going to go down when he came back.

Senator MORGAN. How long had you been Commissioner before you went there?

Mr. SHONTS. I was made Commissioner in April, and I was ready to go on the 20th of June. I created the organization here, and its offices, and had my reservations to sail on June 20. Then Mr. Wallace's cable came up, and I was instructed to stay here until the matter was settled and his successor appointed, if he resigned; and I sailed on the 20th of July.

Senator MORGAN. So that from the 20th of April to the 20th of July you did not go there?

Mr. SHONTS. No, sir.

Senator MORGAN. And you never had been there?

Mr. SHONTS. No, sir.

Senator MORGAN. Did things go along pretty well while you were absent?

Mr. SHONTS. I had not seen what they were before I got there, so that I could not make comparisons. I know the condition they were in when we did get there.

Senator MORGAN. Yes. Have you ever taken your family there to live?

Mr. SHONTS. My family, I am sorry to say, have not been in this country since I have been in the office.

Senator MORGAN. They have not been in this country?

Mr. SHONTS. No, sir. My two girls are at school in England. Their mother has not been well, and she is practically an invalid over there with them.

Senator MORGAN. If the President had said to you, "Mr. Shonts, you must take your wife and children down there and live in that Canal Zone," what would have been your answer to him?

Mr. SHONTS. At that time?

Senator MORGAN. Yes.

Mr. SHONTS. I could not have done it, because all our arrangements had been made a year before to do certain things, and we have not changed our plans.

Senator MORGAN. You would have said: "No; I can not accept your position?"

Mr. SHONTS. I could not have done so, on account of the plans we had already made, which would have had to be changed.

Senator MORGAN. Did not Mr. Wallace have the same right to consult his family interests that you have?

Mr. SHONTS. I have no doubt but what he had.

Senator MORGAN. But it seems to have been entirely overlooked by you, and also by the President and by Mr. Taft, when the accusation came from him of treason against the Commission because he chose to consult his family interests. Is not that true?

Mr. SHONTS. Senator, there has never been any accusation from me against Mr. Wallace yet.

Senator MORGAN. Do you make any now?

Mr. SHONTS. No, sir; I testified to the facts when I was here before as to the conditions that we found there, and in doing so I tried to state them fairly.

Senator KNOX. You have never at any time made any reflection here upon Mr. Wallace for his resignation?

Mr. SHONTS. Never.

Senator KNOX. I thought not.

Mr. SHONTS. Or any place else.

Senator MORGAN. If the President of the United States should require of you that you should take your wife and children to that Isthmus and make your permanent home there as long as you held the office, would you resign or would you stay in?

Mr. SHONTS. Right now?

Senator MORGAN. Yes.

Mr. SHONTS. Well, I do not think I could agree to take my wife and children there, at their age and with their prospects in life. I do not think I could afford to do it; not on my own account, but on their account.

Senator MORGAN. You could not make your home there?

Mr. SHONTS. That is not the point so much as the relations of my family to their future.

Senator MORGAN. Although other men might be willing to do it—Mr. Stevens seems to be delighted to do so—you could not make your home there?

Mr. SHONTS. Not if I had to take my wife and children there.

Senator MORGAN. I say so.

Mr. SHONTS. No, sir; I would not do it.

Senator MORGAN. Do you not think that Mr. Wallace should be accorded the same reasonable review of his own situation?

Mr. SHONTS. I do not see why he should not be.

Senator MORGAN. Neither do I. I never have.

There is a statement here of a contract made by the President of the United States with the California Oil Company, signed "Theodore Roosevelt; by the President; William H. Taft, Secretary of War; January 10, 1906." It is a contract that gives a privilege to the Union Oil Company, of California, for the establishing of pumping stations and pipe lines and connecting them across the Isthmus for the conveyance of oil. Was that subject ever submitted to you for your consideration?

Mr. SHONTS. We received applications from that company and others, not only for the privilege of laying pipe lines, but wanting to make contracts to furnish the Commission with oil. I had the matter up with Chief Engineer Stevens. I had it up with other people, trying to arrive at what a fair comparative cost of oil and coal would be; but we took no definite action. That matter did come to me, and I think I wrote a letter saying that I did not think we should make any exclusive privilege; that if we let those people have it others would probably ask for it, and should receive similar privileges.

Senator MORGAN. You examined those different propositions?

Mr. SHONTS. Yes; I examined some of them.

Senator MORGAN. As president of the Commission?

Mr. SHONTS. Yes, sir.

Senator MORGAN. They were all laid before you, were they not?

Mr. SHONTS. Yes, sir.

Senator MORGAN. Was a meeting held here to consider that subject—of the Commissioners?

Mr. SHONTS. Not of the full Commission; no, sir. It never got to that stage, because we had not made tests to get anything definite to lay before them.

Senator MORGAN. Did you approve or disapprove of the proposition for laying any pipe lines through there at all?

Mr. SHONTS. I thought that was all right, if every fellow had the same show at it.

Senator MORGAN. That it should be granted to a number of persons?

Mr. SHONTS. Either that, or to make one of them a common carrier, or something of that kind.

Senator MORGAN. Was any suggestion made to make one of them a common carrier?

Mr. SHONTS. I have seen that suggestion.

Senator MORGAN. Was it made at the time?

Mr. SHONTS. I do not think it was at the time this was up.

Senator MORGAN. Was the question made at all before the Commissioners, within your knowledge, or before the President, or even the Secretary of War, as to making any person who might be authorized to lay a pipe line there a common carrier?

Mr. SHONTS. Not that I know of.

Senator MORGAN. That never was raised?

Mr. SHONTS. Not that I know of before that time. It has been up since.

Senator MORGAN. Since that time?

Mr. SHONTS. Yes.

Senator MORGAN. Well?

Mr. SHONTS. My recollection is that I wrote a letter to the Secretary about that, but I do not know whether it is in the files or not.

Senator MORGAN. Here is your letter to the Secretary of War, I suppose. It is a memorandum to the Secretary of War, signed "T. P. Shonts."

Mr. SHONTS. I suppose that was it.

Senator MORGAN (reading): "With reference to the request of the Union Oil Company, of California, for a franchise to construct a pipe line across the Isthmus, and following up our conversation of

Monday, I find that the following-named individuals and corporations have from time to time addressed the Commission on this general subject: Union Oil Company, California; Lindon W. Bates, New York."

Is that the same Lindon W. Bates that has got a plan here for the canal and that had that map prepared [indicating]?

Mr. SHONTS. Yes, sir. I understand so.

Senator MORGAN (continuing reading): "The Texas Company, Texas; Associated Oil Company, California; Gulf Refining Company, Pittsburg; Higgins Oil and Fuel Company, Beaumont, Tex.

"The foregoing companies, while not in every instance so stating, have as an underlying motive or desire to furnish to the Commission oil for fuel, but do not make specific proposals setting forth the price at which they would agree to deliver oil.

"There is a consensus of opinion that the equivalent of oil for fuel, as compared with coal, is 90 cents per barrel to \$4 per ton. We have been paying approximately \$4 for Pocahontas coal delivered on the Isthmus, although the last contract for coal was with the Fairmont people at \$3.70 per ton. This Fairmont coal at \$3.70 has been thoroughly tested out and found to be no cheaper and, if anything, less desirable than Pocahontas at \$4.

"At the ratio above set forth the only economy in the use of oil would be cheaper cost of handling between points on the Isthmus. It would cost approximately \$350 to convert each locomotive into an oil burner, and Chief Engineer Stevens states that it would be a troublesome matter to educate the class of firemen on which we are dependent to the use of oil (as they have now been taught to fire with coal); furthermore, in derailments, which are inevitable, it would involve additional danger.

"With the present data and information, the Commission is not inclined, therefore, to substitute oil for coal as fuel.

"The Union Company, however, on a later date (November 28) submitted copy of a concession secured from the Panaman Government authorizing them to lay a pipe line from Chiriqui across to Bocas del Toro, with privilege also of laying a similar line from Panama to Colon, subject to the approval of the officials of the government of the Canal Zone, through which it would have to pass. They state that they have purchased tank steamers, and it is their plan to transport oil to the Pacific terminus, pipe the same across the Isthmus to their steamers for delivery on the Atlantic coast of the United States and elsewhere. They offer as an inducement to the Commission for granting this franchise to cross the Zone that they will agree to sell oil to the Commission or to any future contractor at 90 cents per barrel. They do not, however, make as a condition precedent that the Commission shall purchase its oil, but state their primary object is to secure a pipe line across the Isthmus for transportation purposes.

"In so far as the utilization of oil from the Union Company at 90 cents is concerned, the views of the Commission are set forth in a foregoing part of this memorandum.

"With reference to the granting of this franchise to the Union Company for through transportation purposes, to my mind there are two dominant objections which present themselves at this time:

"1. To grant it to the Union people would be an exclusive concession, contrary to policy, when others are undoubtedly anxious to secure the same privilege.

"2. There is considerable talk about changing the Atlantic terminus of the canal, which, if done, would result in the practical ultimate abandonment of Colon as a transportation terminal.

"It might be added that as a railroad business proposition pure and simple the granting of a pipe-line concession might in effect take away business from the Panama Railroad and in future from the Panama Canal.

"T. P. SHONTS, *Chairman.*"

That was a statement of your objections to granting any of these concessions. Have you waived those objections in any way?

Mr. SHONTS. The concession that was granted is not exclusive.

Senator MORGAN. I understand; but have you ever waived your right to pass upon the question, then?

Mr. SHONTS. Formally?

Senator MORGAN. Or informally.

Mr. SHONTS. No; I just gave those views.

Senator MORGAN. You adhere to them, do you?

Mr. SHONTS. I adhere to them to this extent, that if it is given to one person it should be given to others, or else some provision should be made to make—

Senator MORGAN. Well, the President took it out of the hands of the Commission and ordered that this contract should be made on the 10th day of January, 1906, did he not?

Mr. SHONTS. I suppose so.

Senator MORGAN. Yes. You never consented to that contract as a Commissioner?

Mr. SHONTS. I never have objected to it except, as I tell you, that I did call attention—

Senator MORGAN. It is just as easy to state whether you consented to it or not as it is to state whether you objected, is it not?

Mr. SHONTS. I know; but, Senator, I did not understand what you meant, whether formally or not. I did write a letter about it.

Senator MORGAN. To whom?

Mr. SHONTS. I think to the Secretary of War.

Senator MORGAN. After it was signed or before?

Mr. SHONTS. I think after it was signed.

Senator MORGAN. What did you say?

Mr. SHONTS. I think—can I see the order to refresh my recollection?

Senator MORGAN. Yes. I do not think there is any order of that sort here, or any letter of that sort here from you; but here they are, all of them [handing papers to Mr. Shonts].

Mr. SHONTS. Yes; I just wanted to see. It seemed to me that I wrote a letter, more of inquiry to ascertain the meaning, possibly, than otherwise.

Senator MORGAN. To ascertain the meaning of the contract the President had authorized?

Mr. SHONTS. Yes. This says that it is distinctly understood that it is not an exclusive contract. Oh, I think I wrote a letter saying that if this 90 cents a barrel was the price I believed that if we decided

to use oil and asked for bids we would get bids lower than that; and I think the Secretary said in reply that that was nothing but a maximum, and would not interfere with our getting any lower bids afterwards; so that waived that objection, as I recollect it.

Senator MORGAN. You understood, and so stated here, that this committee had obtained a concession from the Government of Panama to put pumping works in the city of Panama and also in Colon?

Mr. SHONTS. Yes; I understood that.

Senator KNOX. Will you allow me to ask a question?

Mr. SHONTS. Yes.

Senator KNOX. I want to know something about this pipe line. What is the scheme? Are they to pump the oil out of the vessels that bring it down the coast on the Pacific side and then carry it through the pipe line and pump it into the vessel on the other side?

Mr. SHONTS. That is it.

Senator KNOX. It is to shorten the route around the Horn?

Mr. SHONTS. Yes; in the place of going around the Horn.

Senator MORGAN. And a pumping station is an indispensable part of that process?

Mr. SHONTS. Yes.

Senator MORGAN. You want to engage in commerce with the world through the Isthmus?

Mr. SHONTS. Yes.

Senator MORGAN. If you want to send oil from Pennsylvania on to China across that Isthmus, the pumping of it through this pipe line would be an essential part of it?

Mr. SHONTS. Yes.

Senator MORGAN. Otherwise you would have to go around the Horn or around the Cape of Good Hope?

Mr. SHONTS. Yes.

Senator KNOX. But the railroad never could have expected to get in there, by that traffic, any oil by pumping it into tank cars and hauling the cars across the Isthmus and then pumping it into the vessels?

Mr. SHONTS. No. In my language that I think you refer to in my letter I had more in mind the condition after the canal was opened, but I did not lay great stress on that.

Senator KNOX. Would this be a competitor of the canal after the canal was opened? Would the traffic stand the discharge of the vessel on the Pacific side, and then the transit, and then the loading of the vessel on the Atlantic side, if you had an open waterway for the vessel itself to pass through?

Mr. SHONTS. That would be just a question of what tolls should be charged.

Senator TALIAFERRO. Did you not rather refer to the business of the railroad while the canal was being built?

Mr. SHONTS. Well, I did. I covered both in my objection, but I did not lay great stress on it.

Senator KNOX. I do not think, myself, that there is much in your objection.

Mr. SHONTS. No; I do not, myself.

Senator MORGAN. In the case that the canal was completed, I suppose there would be quite a difference in the cost of transportation be-

tween vessels that would leave the location of the Union Oil Company up there on the coast of California and go down to Panama and there discharge into another vessel of the same company to go up on the other side and vessels going around the Horn. In order to get in competition with the oil of Texas or the oil of Pennsylvania or any other oil, those vessels need not be very costly. The shortness of the voyage would dispense with the cost of an immense ship such as would be required to go around the Horn, would it not?

Mr. SHONTS. I am not a practical navigator and I can not answer that, Senator. I do not know about this oil business by water at all.

Senator MORGAN. You know enough about navigation to be able to measure two lines and tell which is the longest, do you not? You could find that out?

Mr. SHONTS. I should think there is something in what you say.

Senator MORGAN. Yes; very good. Now, was this subject urgently pressed upon the Commission?

Mr. SHONTS. These requests?

Senator MORGAN. Yes; for these privileges.

Mr. SHONTS. No; they were not urgently pressed, because to those that spoke to me about it I said that we had not gotten to the point of making our tests, and the chief thing we were interested in was the proposition from the fuel point of view.

Senator MORGAN. Who was the most urgent party?

Mr. SHONTS. Among those?

Senator MORGAN. Yes.

Mr. SHONTS. I do not know that anyone was more urgent than another, Senator.

Senator MORGAN. Do you know any grounds upon which the President selected one of these companies in preference to the other?

Mr. SHONTS. No.

Senator KNOX. Is there any preference?

Mr. SHONTS. Not that I know of. This order says that it is not an exclusive privilege.

Senator KNOX. That is what I understood.

Senator MORGAN. I did not say it was an exclusive privilege in the terms of the contract. Do you not know that a vessel is sailing from Baltimore now with pipes and paint and machinery and engines and everything of that sort on board, or on the highway down there, to put this pipe line in down there?

Mr. SHONTS. I did not know that.

Senator MORGAN. You did not know that?

Mr. SHONTS. No, sir.

Senator MORGAN. The Baltimore Sun says it is so, and gives an account of the ship. That is pretty quick work, is it not?

Mr. SHONTS. Well, I do not know. January 10, February, March—it is sixty days, two months.

Senator MORGAN. To get up the equipment for a pipe line across the Isthmus, with all the pumping engines and everything of that sort, and send it down there—do you think it could be done in two months or three months?

Mr. SHONTS. I do not know a thing about that. I never had anything to do with that sort of thing. I imagine that if the machinery was manufactured, they could have bought it and shipped it all right.

Senator MORGAN. At all events, it evinces industry in the proceeding if they have sent, or if the material is already down there to establish a pipe line. Now, Mr. Shonts, if that pipe line is established there and the pumping stations are put under a contract with the Panama Government in the city of Panama and in the city of Colon, is there ever any chance or any probability of anybody else attempting to put up a competitive establishment?

Mr. SHONTS. I do not know why. If it is profitable to this company, I do not know why it should not be profitable to another company similarly situated.

Senator KNOX. Somebody had to be first, I suppose. Somebody had to lay the first line?

Mr. SHONTS. Yes, sir; somebody would have to lay the first line anyway.

Senator MORGAN. Did you indicate in any way a preference between these companies?

Mr. SHONTS. I did not.

Senator MORGAN. Do you know who was the person that was promoting either of them?

Mr. SHONTS. I do not.

Senator MORGAN. Did any person appear before you for the purpose of promoting them?

Mr. SHONTS. Well, gentlemen were in there, but I did not know them, except as I met them then, and I could not tell you to-day who they were in connection with any one of these companies.

Senator MORGAN. You do not remember?

Mr. SHONTS. No, sir.

Senator MORGAN. Was it not a very urgent business, very urgently pressed upon the Commission?

Mr. SHONTS. Not so far as I was concerned; no, sir.

Senator MORGAN. If this pipe line that is now apparently being built there, under this concession or this contract of the President's, conducts any business, it will be a very important matter, will it not?

Mr. SHONTS. In regard to the transmission of oil? Yes, sir; I should think it would be.

Senator MORGAN. And inasmuch as it is not required to be a common carrier it will be a private carrier?

Mr. SHONTS. I suppose in its present shape it would be limited to the business of this company.

Senator MORGAN. So that the Union Oil Company could send its oil across there in competition against Texas and all the coasts of the Atlantic, and Texas and the coasts of the Atlantic could not send any oil in the other direction to compete with it on the South American coast or down there anywhere, except by going around the Horn?

Mr. SHONTS. Except by doing the same thing or going around the Horn.

Senator MORGAN. Either one or the other. Would you not consider it a very great advantage to be in place and to have your works there and establish a line of business before these other men could possibly get the advantage or the chance to go through there?

Mr. SHONTS. It would depend on the oil market.

Senator MORGAN. The oil market is a market that is very consuming. is it not?

Mr. SHONTS. I do not know much about it, Senator.

Senator MORGAN. It is a big market, is it not?

Mr. SHONTS. It is a big market; yes.

Senator MORGAN. A very big market, and one that attracts the attention of the world to Turkey and Bahu and other places where oil is produced in great quantities. An oil field anywhere in reach of the coast, so that it can get upon the ocean and go abroad to sell its oil, is a very great piece of property, is it not?

Mr. SHONTS. The oil fields do an immense business.

Senator MORGAN. They do an immense business. Do you know of any connection of Rockefeller with any of these propositions?

Mr. SHONTS. No.

Senator MORGAN. None whatever?

Mr. SHONTS. No.

Senator MORGAN. Did you not ever suspect that the old man was in that enterprise? [Laughter.]

Mr. SHONTS. Not from any of the people that called on me.

Senator MORGAN. And of course you do not know which side he was on? You do not know whether he owns the Union Oil Company or not?

Mr. SHONTS. No.

Senator MORGAN. He could if he wanted to, could he not?

Mr. SHONTS. I do not know. I understand that he has a good deal of capital. [Laughter.]

Senator MORGAN. And you have never yet discovered, in all this important matter, who it was that was pressing this subject upon you?

Mr. SHONTS. No one more than another, Senator.

Senator MORGAN. You do not remember the names of any of the men?

Mr. SHONTS. Not right off now, Senator; I do not remember the name of the representative of one of these companies that called on me.

Senator MORGAN. Have you any memorandum of that important matter that you can refresh your memory by?

Mr. SHONTS. We have letters from them and correspondence with them at the office.

Senator MORGAN. From the same men that called on you in person?

Mr. SHONTS. I suppose so. I did not know them before, and I have not seen them since.

Senator MORGAN. Were they urgent in their demands on you for consideration of their claims?

Mr. SHONTS. When I said to each of them what I said to all of them, that we had the subject of oil for fuel under consideration, but we had been busy with more pressing things and had not gotten to the point where we could make any comparative tests to know what we wanted to do and that when the time came for us to go into the subject we would advertise for bids if we wanted to use oil for fuel, they all seemed satisfied to let it go at that and went away.

Senator MORGAN. Were you not quite surprised that the President should take up this particular contract and enter into it himself, over the head of the Commission?

Mr. SHONTS. I do not know that I thought of it as being surprised.

I do not know why he did it. I did not question him at all, except as I wrote the letter.

Senator KNOX. Senator, may I ask a question right there?

Senator MORGAN. Yes.

Senator KNOX. Is not this a mere revocable license to the Union Oil Company?

Senator MORGAN. Well, it speaks for itself.

Mr. SHONTS. Yes; it is revocable.

Senator KNOX. At the pleasure of the President?

Mr. SHONTS. Yes; it is revocable and it is not exclusive.

Senator KNOX. And could it not be revoked by the President if he should insist that the owner of this line should allow other companies to transport their oil through these pipes? Could he not revoke it on that ground if they refused?

Mr. SHONTS. As I understand, he has the authority to revoke it at pleasure.

Senator KNOX. On any ground?

Mr. SHONTS. Yes; on any ground.

Senator KNOX. Or without any grounds?

Mr. SHONTS. At pleasure.

Senator MORGAN. The probabilities of a revocation are very distant after the oil company has established its pumping stations and its pipe line across the Isthmus, are they not?

Mr. SHONTS. I do not know, I am sure.

Senator MORGAN. It would take a pretty strong case to lift a pipe line out of the earth there and tie down the engines, etc.

Senator KNOX. Well, my point is that the President has it in his power to make it a common carrier at any time there is a necessity for its being a common carrier, by reason of having this power of revocation.

Senator MORGAN. That power is not reserved in the contract, is it?

Senator KNOX. Oh, yes; specifically.

Senator MORGAN. Making it a common carrier?

Senator KNOX. No; the power to revoke.

Senator TALIAFERRO. Senator Knox seemed to think that no preference had been given this company. Where there were several companies applying for this privilege and this right and it is given to one and not given to the others, do you not regard that preference was given to this company?

Senator KNOX. Why do you say, Senator, that I regarded it as no preference? I never said anything of that sort.

Senator TALIAFERRO. I understood you to say so.

Senator KNOX. Oh, my dear sir, no; I said nothing of the sort.

Senator TALIAFERRO. I misunderstood you, then.

Senator KNOX. Oh, yes; you entirely misunderstood me. The point I am trying to make is that it is in the power of the President of the United States to dictate the policy of that line, and that if they do not do what he wants them to do for the common and public good he can revoke their license.

Senator TALIAFERRO. I fully agree with you as to that, Senator.

Senator KNOX. You entirely misapprehend me.

Senator TALIAFERRO. A few moments ago, when you interrupted the witness, I understood you to say that.

Senator KNOX. Oh, no; you can read back the record if you want to. You will find that you were mistaken.

Senator TALIAFERRO. Of course your statement is sufficient. I simply understood you that way. I misunderstood you; that was all.

Senator MORGAN. Do you wish to go on further?

Senator TALIAFERRO. No; go on, Senator Morgan.

Senator MORGAN. Has the President in any other instance at all ever taken the matter of making the contract for any supplies to be furnished to the canal or any work to be done on the canal or in the Canal Zone or on the railway out of the hands of the proper Commissioners and dealt with it himself, privately and personally?

Mr. SHONTS. No, sir.

Senator MORGAN. It never has occurred before?

Mr. SHONTS. No, sir.

Senator MORGAN. Can you state any reason why this is an exceptional case?

Mr. SHONTS. Yes, sir; as I understand it, it is a right that only lodges with the Executive. It is a right of—well, I do not know that I will use the right technical term—"eminent domain." He can give a privilege of that kind that the Commission can not give.

Senator MORGAN. Is there any right of eminent domain?

Mr. SHONTS. I say I may not be using the right term.

Senator MORGAN. Was it not argued before the President, and before you, by Secretary Taft that the privilege of laying this pipe line on the ties of the railroad or along the track of the railroad might become very inconvenient?

Mr. SHONTS. They can only use such land as the railroad permits them to.

Senator MORGAN. I know; but they claim the privilege of laying the pipe line along the track of the railroad.

Mr. SHONTS. Oh, no; not on the track—on the right of way.

Senator MORGAN. On the right of way?

Mr. SHONTS. Yes.

Senator MORGAN. To keep from digging down the hills, they can run it through the ditch that the railroad runs through?

Mr. SHONTS. If the railroad consents.

Senator MORGAN. If the railroad consents to it; yes. And they might run on the ties if it was necessary to do it?

Mr. SHONTS. Oh, no; we would not consent to that.

Senator MORGAN. How do you know?

Mr. SHONTS. Because it would not be compatible with good railroading to have any person interfere with your ties.

Senator MORGAN. It looks to me as though the whole business was incompatible with good railroading. First of all you take the traffic off of the road and put it in a pipe line.

Mr. SHONTS. There really is no traffic of that kind to speak of.

Senator MORGAN. But there is a prospect of it?

Mr. SHONTS. Possibly.

Senator MORGAN. A pretty lively prospect. I read the number of ships that they had on the other side—I believe I read that to you, the number of ships this company own and have ready on the other side for the purpose of bringing the oil down to the railroad for conveying it out to market. Their letters show that.

Mr. SHONTS. The point I was making, Senator, was that without

the pipe line they would not have the ships there. They have not been shipping any oil on the railroad.

Senator TALIAFERRO. The expenses across the Isthmus would make it impossible for them to compete.

Mr. SHONTS. They have no way now of breaking bulk.

Senator MORGAN. But they would have if the pipe line was established?

Mr. SHONTS. With the pipe line they could pump it from their ships.

Senator MORGAN. They could pump it from a ship on the other side to a ship on this side and carry it on?

Mr. SHONTS. Yes; but there is no paraphernalia to do it now.

Senator MORGAN. That pipe line would save the expense and danger of a voyage around the Horn—about 16,000 miles, is it not, or 14,000?

Senator KITTREDGE. About 9,000 miles.

Senator MORGAN. Nine thousand, is it?

• Senator KITTREDGE. As I recollect.

Senator MORGAN. From the Bay of Panama around to Colon?

Senator KITTREDGE. As I recollect, it is.

Senator MORGAN. I had not computed the distance. Have you told all you know about this, Mr. Shonts?

Mr. SHONTS. Yes, sir. [Laughter.]

Senator MORGAN. I will now turn the witness over to anybody else who wants to examine him.

Senator KITTREDGE. Mr. Shonts, did you personally purchase the two steamships for the railway company?

Mr. SHONTS. I personally had charge of the purchasing. I did not personally do it.

Senator KITTREDGE. Tell us about their purchase.

Mr. SHONTS. You wish me to give you, briefly, the history of the matter?

Senator KITTREDGE. Yes.

Mr. SHONTS. It developed that the Panama Railroad and Steamship Line owned three vessels, the *Finance*, the *Advance*, and the *Allianca*; the *Finance* and *Advance* being sister ships of about, as I recollect, 2,200 tons, and the *Allianca* larger—as I recollect, about 3,200 tons. They were chartering the *Seguranca* and another ship, the name of which I have forgotten just now. The *Seguranca* was the largest ship in the fleet, and we were having to go outside of those regularly chartered and owned ships and make special charters in order to get our materials forward promptly, the old Commission having bought nearly everything delivered in New York.

So we discussed the matter—the Commission and the Secretary of War and the President—and on our recommendation the President authorized the purchase of two ships of larger tonnage and larger passenger-carrying capacities. We made inquiries as to all ships that would approximate our requirements in this country. We heard of two ships that the Ward Line owned—the *Mexico* and the *Havana*—for which at that time, it was reported to me, they asked \$750,000 apiece. The ships, as I recollect it, were about five or six years old at that time.

Upon inquiring among ship brokers and gentlemen that I knew had a good deal of information about the values of ships, they thought that was a little high; and I therefore thought it might be a

good thing to send one of our people over to the other side and inquire about the price of ships over there and the kind of ships that were offered for sale; and Mr. Farnham, who had had more or less to do with shipping, and knew more or less about ships, was instructed——

Senator MORGAN. Do you mean more or less? [Laughter.]

Mr. SHONTS (continuing). To go to Europe to ascertain and report on the prices and character of the ships offered for sale there. Mr. Farnham went across and made a number of reports. There was only one ship that really, according to those reports, approximated our requirements. That was a new ship just being built, just being finished. The rest were either too big or too little, or too fast or too slow, or there was some serious objection. They were away off from our general requirements. We decided that we wanted about a 5,500 or a 6,000 ton ship of at least 16 or 17 knot speed, that would carry 100 first-class and 50 second-class passengers. That was about a rough outline of what we were looking for. He recommended this ship that I speak of as being about finished, because it was of a large freight capacity, with big hatches, and was a strong freight ship.

Senator KITTREDGE. You are now speaking of the English ship?

Mr. SHONTS. Of the English ship; yes, sir; and he finally got a price on it. I have forgotten the figures, but——

Senator MORGAN. In regard to the English ship?

Mr. SHONTS. In regard to the English ship. As I say, I have forgotten the figures; but thinking it might have a good effect I made him a flat offer under the price he stated—sufficiently under that they did not accept it.

Senator MORGAN. You made him an offer?

Mr. MORGAN. I authorized him to make an offer for that particular ship.

Senator MORGAN. Oh, yes.

Mr. SHONTS. Meantime I had gotten acquainted with a gentleman who represents the Cunarders in New York, and who had formerly been a director of the Panama Railroad.

Senator KITTREDGE. What was his name?

Mr. SHONTS. I am trying to think of his name. I will get his name. I am not very good on names, Senator.

Senator KITTREDGE. Will you supply it in the record?

Mr. SHONTS. Yes; I will supply that name. Can I ask Mr. Ross here?

Senator TALIAFERRO. Yes; so far as I am concerned.

Mr. SHONTS (to Mr. Ross). Do you remember the name?

Mr. ROSS. No; I do not. I can look it up for you, though, and get it this afternoon.

Mr. SHONTS. I am very poor on names; but he is a man of very high standing in New York, and a man that is an expert in shipping and knows the value of ships. I met him, and his relations with the Ward people were very close——

Senator KITTREDGE. In what way?

Mr. SHONTS. I understand that they exchange business in a business way. He is the agent for the Cunard Line, and I understand that they and the Ward Line have commercial relations back and forth.

Senator MORGAN. A man who had formerly been a director of the railroad?

Mr. SHONTS. I understand that he had been; yes.

Senator MORGAN. Was it Guggenheim?

Mr. SHONTS. No.

Senator MORGAN. Was it Gudet?

Mr. SHONTS. No, sir.

Senator MORGAN. Was it Buchanan?

Mr. SHONTS. No.

Senator MORGAN. Was it Wheeler?

Mr. SHONTS. No.

Senator MORGAN. It was not Admiral Walker? [Laughter.]

Mr. SHONTS. No.

Senator KNOX. Or Mr. Cromwell?

Mr. SHONTS. No; it was not Mr. Cromwell, Senator.

Senator MORGAN. Was it Bouyard?

Mr. SHONTS. No.

Senator MORGAN. Was it McLaughlin?

Mr. SHONTS. No.

Senator MORGAN. Was it Henry L. Martin, Henry Abbott?

Mr. SHONTS. No; it was not Henry Abbott.

Senator MORGAN. Was it Charles Paine?

Mr. SHONTS. No. I do not know when he was the director of the railroad, but he had been, so I was told.

Senator KITTREDGE. Had he any financial interest in the Ward Line?

Mr. SHONTS. No, no, no. He was and is, as I understood, the general agent for the Cunard Steamship Line in this country, located in New York. They simply had business relations, so that he knew the Ward people; and by that time the Ward people had asked \$700,000. They had come down to \$700,000 for each of these ships, and in talking with this gentleman, whom I met through Mr. Drake, the assistant to the president of the Panama Railroad, I was told that \$700,000 was as low as they would go.

Senator KITTREDGE. Who told you that?

Mr. SHONTS. I do not remember, but it was the talk in the office up there which came in, and Mr. Drake was getting information all the time. Probably Mr. Drake told me.

Senator KITTREDGE. Was it some one connected with the railway company?

Mr. SHONTS. With the Panama Railroad office—yes.

Senator KITTREDGE. In whose office?

Mr. SHONTS. The Panama Railroad office.

Senator KITTREDGE. In the general office?

Mr. SHONTS. Yes; the general office in New York.

Senator KITTREDGE. The vice-president's office?

Mr. SHONTS. Mr. Drake is assistant to the president; that is his title; yes, sir.

Senator KITTREDGE. In his office?

Mr. SHONTS. Yes; in his office. I have an office there now; we are side by side.

Senator MORGAN. Was it not Farnham?

Mr. SHONTS. No, no; it was not Farnham. No; Farnham was in England at this time. He went over there.

Senator MORGAN. Oh, he was over on the other side?

Mr. SHONTS. Yes; he was sending the reports from there, and I was trying to trade here.

Senator MORGAN. Are these Ward people that you speak of the English people, or the Cunarders?

Mr. SHONTS. The Ward Line runs from New York south. They run to Cuba.

Senator MORGAN. Oh, they were a third party?

Mr. SHONTS. Yes; they were the owners of the *Mexico* and the *Havana*.

Senator MORGAN. They are not the Cunard Line?

Mr. SHONTS. Oh, no; they are not the Cunard Line.

Senator MORGAN. Or the British company, but a separate company?

Mr. SHONTS. A separate company; yes. So it seemed as though we were not going to trade, for I did not think I would be justified in paying \$700,000, and it looked as though we were not going to be able to get them for less; and after talking with this gentleman I finally said to him—

Senator KITTREDGE. To whom do you refer?

Mr. SHONTS. This man, whose name I can not think of just now—this representative—it is unfortunate that I do not remember names better—the representative of the Cunard Line in New York. I said: "I am willing to pay, flat, \$650,000 for each of those ships, subject to survey and inspection, if they are all right, but I will not pay a cent over. I will not pay any commissions to anybody; and if you want to be good enough to help us get those ships at that price, as a patriotic duty or as a citizen, I will be very glad to have your assistance." He took the task in hand, and he finally got it through. That was the way the ships were bought for \$650,000.

Senator KITTREDGE. In making this purchase you relied upon the judgment and advice of this gentleman connected with the Cunard Line?

Mr. SHONTS. Partly—partly.

Senator KITTREDGE. On anyone else?

Mr. SHONTS. Oh, yes; I had had a talk with the manager of the Cramps, who built the ships, and he told me—

Senator KITTREDGE. What was his name?

Mr. SHONTS. He was the manager of Cramp & Co., who built the ships. I have forgotten his name.

Senator KITTREDGE. What did he say to you?

Mr. SHONTS. He told me that the ships were well built, and were built at a time when material was cheap, and that they had spent a great many thousand dollars additional to their original cost in strengthening them since, because of heavier tonnage that they wanted to carry; and that he thought now, besides the delay of a year and a quarter or a year and a half to get new ships, it would cost a good deal more money to build them than the \$700,000. I was talking to him on the \$700,000 basis. He thought they were cheap, considering their condition and age, at \$700,000.

Senator KITTREDGE. Did you talk with anyone else regarding their value?

Mr. SHONTS. Mr. Drake talked to a great many people in regard to it, and kept reporting to me what these various people said.

Senator KITTREDGE. In writing?

Mr. SHONTS. No; as I would be there in New York. I was there a good deal during this time.

Senator KITTREDGE. Do you remember with whom he conferred on the subject?

Mr. SHONTS. No, no; I do not remember. If you want that information I can get it for you, or he can come before you.

Senator KITTREDGE. Did you consult with anyone else?

Mr. SHONTS. As I recollect it now, it was with Mr. Drake and the people he told me about, with the manager of the Cramps, who had built the ships, and with this gentleman of the Cunard Line, who was a man of high character and standing, and who gave me his opinions in regard to it.

Senator KITTREDGE. Did you talk with anyone whom Mr. Drake mentioned?

Mr. SHONTS. No. That is all I remember now of talking to personally, Senator; but Mr. Drake talked with a great many, and he himself knew the ships very well.

Senator KITTREDGE. Who made the inspection of these ships after the contract was made?

Mr. SHONTS. They have regular boards of inspection.

Senator TALIAFERRO. Government boards?

Mr. SHONTS. They are regular boards that do that work for all the companies. I think there are two or three of them, and we had what we supposed was the best and most rigid board to do this work.

Senator KITTREDGE. That is what I am getting at.

Senator MORGAN. They are a board employed for insurance purposes, are they not?

Mr. SHONTS. Both, I think—both for survey and insurance.

Senator MORGAN. These boards fix the value of a ship to the insurance companies?

Mr. SHONTS. Yes; I think they do that also. I do not remember the name of that board. I will get all that data for you.

Senator MORGAN. Do you know what value these boards put upon the ships to the insurance companies that held the policies issued earlier upon these vessels?

Mr. SHONTS. We have insured them for their full cost, \$650,000.

Senator MORGAN. You have now?

Mr. SHONTS. Yes.

Senator MORGAN. What were they insured at then?

Mr. SHONTS. I do not remember; it was not the full value. The Ward people did not insure them to their full value; they took a part of the risk.

Senator MORGAN. They took a part of the risk?

Mr. SHONTS. Yes; but we insured them to their full value, so evidently they thought they were worth what we paid for them.

Senator MORGAN. But there is an appraisalment of the full value upon the books of the insurance company?

Mr. SHONTS. I suppose so.

Senator MORGAN. Yes. You do not know what that is?

Mr. SHONTS. No; I do not.

Senator KITTREDGE. Was the report of the inspection board made in writing to you or to the Commission?

Mr. SHONTS. Oh, yes; to the railroad. That is in the railroad files.

Senator KITTREDGE. Can you send us a copy of that?

Mr. SHONTS. Yes.

Senator KITTREDGE. Or the original, whichever is convenient for you.

Mr. SHONTS. Yes.

Senator TALIAFERRO. You were speaking about an offer that you made for the foreign ship, Mr. Shonts.

Mr. SHONTS. Nothing came of that; they did not accept it.

Senator TALIAFERRO. You offered the price that you thought the Government ought to pay?

Mr. SHONTS. Well, really, I thought these two ships that we bought were best adapted to our purposes if we could get them at the right price.

Senator KITTREDGE. Will the report you have mentioned disclose the condition of the boilers and machinery of the ships?

Mr. SHONTS. I think so. I think it was a complete report.

Senator KITTREDGE. Do you remember the condition disclosed by that report?

Mr. SHONTS. I do not remember the details, Senator, except that it was up to their standard—their requirements—with regard to what we expected to get.

Senator KITTREDGE. What was included in the purchase—the furniture of the ship?

Mr. SHONTS. Yes; and the silver and the china and the linen; but they agreed to take those things back at a fair price, because they were marked with the Ward Line marks, and we knew we would want to put in our own linen and our own china, etc.

Senator KITTREDGE. Was that done?

Mr. SHONTS. That was authorized to be done, and I have no doubt it has been done. I know it was done to a certain extent. It has not been reported to me that it was all cleaned up. I do not know whether it is all finished or not. It takes some time to do that.

Senator KITTREDGE. To what extent does the agreement you have mentioned apply?

Mr. SHONTS. What do you mean?

Senator KITTREDGE. To what extent does it apply to the furniture?

Mr. SHONTS. We got the ship in seagoing condition; and, as I recollect it, the agreement was that they would take back the silver and the china and the linen (because it was all marked with the Ward Line marks) at an agreed price when we got our new linen and silver and china there to take its place.

Senator KITTREDGE. And you agreed that they might do this?

Mr. SHONTS. Oh, yes; we wanted them to do it. Another thing in that connection was that we had never had any standard of anything on the steamships. Every ship had its own kind of china, and things of that kind, and I thought we ought to establish a standard; so we did.

Senator KITTREDGE. Have you a personal recollection of what other furnishings were agreed to be returned to the Ward Line after you had made your purchases?

Mr. SHONTS. That is all I recollect, Senator.

Senator KITTREDGE. Have you any inventory or writing showing just what was done?

Mr. SHONTS. That is all in the railroad office, no doubt, in New York.

Senator KITTREDGE. Can you send that information to us?

Mr. SHONTS. Yes. Just how much exchange has been made, you mean?

Senator KITTREDGE. Yes; and what was agreed to be made.

Mr. SHONTS. Yes.

Senator KITTREDGE. I want to know the terms as well, if you have a writing upon the subject.

Mr. SHONTS. Yes.

Senator MORGAN. If I understand you correctly, Mr. Farnham had nothing to do with the inspecting or making the trade or carrying on any of the negotiations in respect to the Ward Line steamers that you bought?

Mr. SHONTS. Not after he went abroad. I think that he did look at them before he went abroad.

Senator MORGAN. Did he ever make any report about it?

Mr. SHONTS. He talked with me about them. I do not think he ever made any official report.

Senator MORGAN. What price did they propose to Farnham to take for them?

Mr. SHONTS. I am not sure whether it was \$700,000 or \$750,000 at first.

Senator MORGAN. And you gave how much for them?

Mr. SHONTS. Six hundred and fifty thousand dollars.

Senator MORGAN. Six hundred and fifty thousand dollars?

Mr. SHONTS. Yes.

Senator MORGAN. After he had had his talk with you about these Ward Line ships, then he went abroad and inspected an English ship?

Mr. SHONTS. Yes.

Senator MORGAN. Only one?

Mr. SHONTS. Oh, no; he inspected a lot of them.

Senator MORGAN. Did he report upon them?

Mr. SHONTS. A number of them.

Senator MORGAN. Did he report upon them as to prices, and all that?

Mr. SHONTS. Yes; we have a long report from him.

Senator MORGAN. You have a copy of that report, have you?

Mr. SHONTS. I can get it.

Senator MORGAN. I would like to have it in this record.

Mr. SHONTS. All right.

Senator MORGAN. You will furnish it if you please. Then you have the prices of all of them, and a description of the ships?

Mr. SHONTS. All that he wrote about—a description of the ships, etc.—yes, sir.

Senator MORGAN. Did he acquire this knowledge of shipping, ship-building, and ship values while he was a clerk in the law office of Mr. Cromwell in New York?

Mr. SHONTS. I understood that he had had more or less to do with shipping for some years. I think some one told me he had sailed before the mast.

Senator MORGAN. He was a sailor before the mast?

Mr. SHONTS. That he had been in the shipping business.

Senator MORGAN. He has been in the employment of this law office on a salary for a number of years.

Mr. SHONTS. I do not know anything about that. I know that I have been told——

Senator MORGAN. Mr. Cromwell's statement to that effect is in the record.

Mr. SHONTS. Yes; I mean I did not know it personally.

Senator KITTREDGE. Do I understand you, Mr. Shonts, to say that the Ward Line was to replace free of cost to the Government the articles that you turned over to it?

Mr. SHONTS. Oh, no; we were to buy our own linen and our own silver and our own china, and they were to take their old ones at some agreed price.

Senator MORGAN. Was not Mr. Farnham sent out for the purpose of skirmishing amongst the English shipowners to see what the prices were?

Mr. SHONTS. Well, yes; he was to report on ships and prices.

Senator MORGAN. Ships and prices?

Mr. SHONTS. Yes.

Senator MORGAN. Was it not your purpose, if you could possibly do it, to buy an American-built ship?

Mr. SHONTS. Yes, sir.

Senator TALIAFERRO. It was your purpose particularly to buy these two ships because you thought they were adapted to your purpose?

Mr. SHONTS. They were more nearly adapted to our work than any others.

Senator MORGAN. Did Farnham render any other service in this purchase of ships except to examine and report upon the prices and the conditions and the form and size and power, etc., of the English ships?

Mr. SHONTS. No.

Senator MORGAN. You sent him across there just to sample the market, to find out what you could get ships for there?

Mr. SHONTS. Well, both, Senator. I did not know how it was going to turn out. We might have run across a bargain there. We might have gotten good ships there that answered our purposes. But as a matter of fact, we only heard of the one that he strongly recommended. That was a new ship, and would answer our purposes, because it had big hatches and was a big freight carrier.

Senator MORGAN. Do I understand that they dropped a hundred thousand dollars on each ship from the price they first asked?

Mr. SHONTS. The price was not paid to me at any time, you understand. I was told that they had commenced at \$750,000; but I know that they talked very strongly at \$700,000. We finally traded at \$650,000.

Senator MORGAN. Yes; and they made a patriotic sacrifice for the flag, and came in and sold them for \$650,000?

Mr. SHONTS. I do not know about that. I do not know what their motives were; but they accepted \$650,000 each, and we got the ships.

Senator MORGAN. You determined not to buy an English ship if you could get an American ship as good as that at the same price, did you?

Mr. SHONTS. Yes; we thought that we could afford to pay a little more for an American ship, if we had to, in order to carry the American flag and have the benefit of the coastwise shipping.

Senator MORGAN. Did you observe the same rule in regard to buying steel rails for furnishing the railroad down there?

Mr. SHONTS. We have not bought any steel rails abroad, because we have gotten cheaper prices at home; but we have bought some things abroad.

Senator MORGAN. Yes; Mr. Stevens testified that you had gotten prices here delivered at Colon that were the market prices at the factory. Is that true?

Mr. SHONTS. Suppose you ask Mr. Ross. He can tell you exactly what those figures were.

Senator MORGAN. I believe it was Mr. Ross who made the statement, instead of Mr. Stevens. It was Mr. Ross.

Senator TALIAFERRO. It was at Baltimore, Senator; not at Colon. He testified, as I remember, that he got them delivered in Baltimore.

Senator MORGAN. Not at Colon?

Senator TALIAFERRO. Not at Colon, at the price at the mills, so that he saved the freight and got a "foreign" price.

Mr. SHONTS. The domestic price was \$28. I know that was about the substance of it.

Mr. Ross. We paid \$26.45 delivered at Baltimore. What is known as the domestic price, the standard price, is \$28 at the mill.

Senator MORGAN. But you did buy foreign rails?

Mr. Ross. No, sir; that was rail made in this country.

Senator MORGAN. You never have bought any foreign-made rails at all?

Mr. Ross. No, sir.

Senator MORGAN. Have you bought any rails that had been exported to England and reimported?

Mr. Ross. No, sir.

Senator MORGAN. You bought American rails by making them accept the English prices?

Mr. Ross. I presume they figured that they might get in competition, and that was the reason.

Senator TALIAFERRO. I understood, Senator Morgan, that that was their regular price for foreign use; that they bought them at the price that the mills established for foreign use, and that price was \$26 and what?

Mr. Ross. \$26.45, delivered in Baltimore.

Senator TALIAFERRO. \$26.45, delivered at Baltimore, as against \$28?

Mr. SHONTS. Twenty-eight dollars at the mills. flat—the domestic price.

Senator TALIAFERRO. For domestic use?

Senator MORGAN. So they made the concession, then, of considering us foreigners for the purpose of selling us the rails? That was how it was? Well, that was very convenient.

You have examined the dam projected at Gatun in the plan proposed by the minority of the Commission—the foreign commission, I will call it—for the establishment of a lock canal across the Isthmus? You have examined that through and through?

Mr. SHONTS. I have examined that.

Senator MORGAN. Do you, as an engineer, approve of the practicability of that dam?

Mr. SHONTS. I can not approve of it as an engineer, Senator, because I am not an engineer.

Senator MORGAN. You are not an engineer? You do not know whether it is practicable or not, then?

Mr. SHONTS. Only from what the engineers in whom I have confidence tell me.

Senator MORGAN. That is all—you take their testimony and their opinion?

Mr. SHONTS. Yes.

Senator MORGAN. You have no opinion, as a Commissioner, as to whether it is practicable or not?

Mr. SHONTS. Not from an engineering point of view, because I am not an engineer.

Senator MORGAN. The whole question of a lock canal, as presented by the minority of what I call the "foreign commission," depends upon the establishment, durability, practicability, and usefulness of the dam at Gatun?

Mr. SHONTS. That is right.

Senator MORGAN. That is all—it depends entirely upon that?

Mr. SHONTS. Yes, sir.

Senator MORGAN. And about that, you say that you, not being an engineer, have no engineering knowledge or opinion. As a practical railroad man, can you express one?

Mr. SHONTS. As a practical railroad man, if what they say is true in regard to there being 200 feet of impervious material as a foundation extending across the 7,700 feet of opening, I would say that it was entirely practical and feasible.

Senator MORGAN. And you would recommend the railroad company, if the railroad had to build a dam, to build it?

Mr. SHONTS. On the faith that I have in the engineers who make that statement?

Senator MORGAN. Yes.

Mr. SHONTS. Yes.

Senator MORGAN. Very good; that is all I wanted to ask you.

Senator KITTREDGE. Mr. Shonts, will you also furnish us with a statement of purchases made for the ships you have described?

Mr. SHONTS. Yes, sir; yes, sir.

Senator KITTREDGE. Mr. Shonts, last fall you sold some bonds of the Panama Railway Company?

Mr. SHONTS. Yes, sir.

Senator KITTREDGE. Six hundred and twenty-eight thousand dollars of them?

Mr. SHONTS. Yes, sir.

Senator KITTREDGE. When was that?

Mr. SHONTS. On what date were they sold?

Senator KITTREDGE. Yes.

Mr. SHONTS. I would have to look up the records to tell you that.

Senator KITTREDGE. About what date?

Mr. SHONTS. It was in November or December; I do not know the exact date, but I can get it.

Senator KITTREDGE. Of what year?

Mr. SHONTS. Last year—1905.

Senator KITTREDGE. What amount did you receive for them?

Mr. SHONTS. One hundred and five.

Senator KITTREDGE. And what was done with the money?

Mr. SHONTS. That was deposited in the banks up there in New York.

Senator KITTREDGE. And what was the necessity of the issuance of those bonds or the sale of them?

Mr. SHONTS. The Panama Railroad Company had created obligations for new equipment and construction aggregating about \$1,300,000, which were coming due. The Walker Canal Commission owed the canal company as of date December 1 about \$600,000, and had no money to pay its obligations. The directors of the Panama Railroad, some time before this time, knowing that these purchases had been made, had authorized the sale of these bonds.

Senator TALIAFERRO. The directors?

Mr. SHONTS. Yes.

Senator KITTREDGE. In what manner was that authorization made?

Mr. SHONTS. In a meeting of the board of directors, by a resolution.

Senator KITTREDGE. Can you give us the minutes of that meeting?

Mr. SHONTS. Yes.

Senator MORGAN. While you are looking that up, just let me ask Mr. Shonts one question. You say they were owing the Panama Railroad Company how much?

Mr. SHONTS. As of date December 1, as I recollect the figures, about \$600,000.

Senator MORGAN. You have got the facts at your command to show what it was?

Mr. SHONTS. Just what it was.

Senator MORGAN. On what account?

Mr. SHONTS. Yes, sir.

Senator MORGAN. Each item?

Mr. SHONTS. Yes, sir.

Senator MORGAN. You mean by that that they owed the United States that much, do you not?

Mr. SHONTS. I mean that the Isthmian Canal Commission owed the Panama Railroad that amount.

Senator MORGAN. That means the United States, does it not?

Mr. SHONTS. Well, yes; in a sense.

Senator KITTREDGE. So it was just a transfer from one pocket to another?

Mr. SHONTS. With this difference, Senator, that the Panama Railroad Company is being operated under its charter, which is a New York charter, and its board of directors held that it was its duty to protect its credit. They also held that it was their privilege and duty to protect its credit. Inasmuch as they could not collect from the Isthmian Canal Commission enough money to protect its credit and meet its maturing obligations, it acted under the authority of its charter and its resolutions of its board of directors and sold those bonds. It had either to do that or to go in the market and make a loan.

Senator MORGAN. Why could it not come to Congress and ask for an appropriation?

Mr. SHONTS. Congress was not in session then.

Senator MORGAN. Why did it not go to the President and ask for an appropriation out of the funds for building the canal?

Mr. SHONTS. Why, that money was gone, Senator. That was the reason the Isthmian Canal Commission could not pay its debts.

Senator MORGAN. Oh, yes.

Senator KITTREDGE. Who was present at the directors' meeting of which you have spoken?

Mr. SHONTS. When this authority was given?

Senator KITTREDGE. Yes.

Mr. SHONTS. I think the full board.

Senator KITTREDGE. The minutes will show?

Mr. SHONTS. The minutes will show. You mean when this authority to sell these bonds was given?

Senator KITTREDGE. Yes.

Mr. SHONTS. The minutes will show.

Senator MORGAN. Was the minister from Panama present?

Mr. SHONTS. I do not remember.

Senator MORGAN. I would like for you to state whether he was or not.

Mr. SHONTS. I will get you the minutes, Senator.

Senator TALIAFERRO. Mr. Shonts, I understand you to say that you are operating this road under the New York charter?

Mr. SHONTS. Yes.

Senator TALIAFERRO. I understood you to testify this morning that you had never read that charter.

Mr. SHONTS. I have not.

Senator TALIAFERRO. Then you do not really know whether you are operating under it or not or in accordance with it?

Mr. SHONTS. Well, yes; I think we are. I think I can say that without having read it. I asked the question of the Secretary of War whether we could operate it as an arm of the Government or under its charter. He said to go ahead under its charter. Now, I have not read this particular charter, but I have read others, and I think we know what our rights and duties as directors were; and it was because—I am trying to get back to your question, Senator Kittredge—it was because these obligations for construction and equipment were maturing and had to be met, because the advances, and so forth, on account of the Isthmian Canal Commission ran into such large figures (as I say, approximately \$600,000 of that date), that we had to raise the money to protect our credit. There was either one of two ways to do it, from our point of view. That was to sell the bonds and raise the money in that way—the bonds were placed in the Treasury for that purpose originally—or to go out in the street and borrow the money.

At that time money in the street was loaning, as I was told—I was not borrowing any, but I was told that it ran from 25 to 30 per cent, and within a very few days of that time it was 100 or 125 per cent. So, acting under the authority of the resolution that I have spoken of, we offered those bonds for sale at the call price, which was 105. That is to say, we could have called those bonds in, and did call them in, at the same price that we got for them, barring the interest that accrued from the last interest-bearing period up to the time that they were called in. That was the way that transaction came about and the reason we did it.

Senator KITTREDGE. Did you have legal advice about the question of the sale of these bonds?

Mr. SHONTS. Yes; we had the legal advice of Mr. Cromwell, general counsel of the road.

Senator KITTREDGE. Given at the meeting?

Mr. SHONTS. He had been present at all those meetings and joined in the discussions.

Senator MORGAN. Did Mr. Cromwell sell these bonds?

Mr. SHONTS. No; the bonds were sold by Mr. Drake.

The CHAIRMAN. What is the date that you say they were sold?

Mr. SHONTS. I do not remember the exact date.

The CHAIRMAN. Or about the date?

Mr. SHONTS. It was, I should say, early in December.

Senator KITTREDGE. Was the debt you have mentioned incurred for the benefit of the railroad company or the Canal Commission?

Mr. SHONTS. The debts that were maturing were incurred for the benefit of the railroad company, the railroad's equipment, and some of its construction work; but some of the money that the Commission owed the railroad was for advances made by the railroad for the Commission, as well as for freight, etc.

Senator KITTREDGE. Tell us about those advances and when they were made.

Mr. SHONTS. As I understand, before I came with the Commission the railroad bought some rails—I do not know this of my own knowledge, but I understand that the railroad bought some rails for the Commission and paid for them out of their moneys, and that was one of the items.

Senator KITTREDGE. One of the items going to make up the \$600,000 you have mentioned?

Mr. SHONTS. Yes, sir.

Senator KITTREDGE. As due from the Commission to the railway company?

Mr. SHONTS. That is what I was told; yes.

Senator KITTREDGE. How much was the railway company indebted at the time Congress made the appropriation in December for the benefit of the canal construction?

Mr. SHONTS. How much had they advanced?

Senator KITTREDGE. Yes.

Mr. SHONTS. I could not answer offhand how much they had advanced, Senator.

Senator KITTREDGE. What is the financial condition of the railway company to-day?

Mr. SHONTS. I have not had a report of it for several days, but when we called in those bonds we got authority from the Secretary of War to borrow \$650,000.

Senator KITTREDGE. From whom was it borrowed?

Mr. SHONTS. The railroad borrowed \$650,000, as we needed it, from the Isthmian Canal Commission, and since I have been here to-day I have signed a note for the first of that, I think, for \$150,000.

Senator KITTREDGE. Given by the railroad company?

Mr. SHONTS. Given by the railroad company to the Isthmian Canal Commission, to bear interest at the rate of 4 per cent.

Senator KITTREDGE. What about the remainder of that debt?

Mr. SHONTS. We are drawing those sums out as these obligations come due, just as slowly as we can, to save the interest, taking into consideration what we have from our current operating expenses in our treasury all the time. We are trying to work out of it without borrowing the full amount of the original contract price of the construction and equipment.

Senator KITTREDGE. To what extent has the railway company made purchases for the benefit of the Canal Commission?

Mr. SHONTS. I say, the only thing that I know of is those rails. I was told that they bought them before I came with the Commission. Since we have been here, to the best of my knowledge, each has been doing its own purchasing.

Senator KITTREDGE. Since you testified some little time ago have you heard anything of the condition of freight congestion at the Isthmus?

Mr. SHONTS. Yes, sir.

Senator MORGAN. Before you go into that matter I would like to ask a question about this particular subject.

Senator KITTREDGE. Certainly.

Senator MORGAN. If I understood you correctly, Mr. Shonts, the Commission became indebted to the railway company?

Mr. SHONTS. Yes, sir.

Senator MORGAN. In a very considerable sum of money?

Mr. SHONTS. About \$600,000, as I recollect the figures as of December 1.

Senator MORGAN. And in order to pay that debt, or to provide the Commission with money, and also to discharge some debts that were due from the railway company, these bonds were sold?

Mr. SHONTS. No; the bonds were not sold to pay any of the debts of the Commission, Senator.

Senator MORGAN. Well, to pay the debts of the—

Mr. SHONTS. Of the railroad company.

Senator MORGAN. How much was the debt of the railroad company, all told, at that time, in rounds sums?

Mr. SHONTS. Up until, I think, July 1 the amount of the obligations contracted for was, in round numbers, \$1,300,000; but the amount that was due up until that time, as I recollect it, was in the neighborhood of half a million dollars. As the deliveries were made the obligations would mature.

Senator MORGAN. And you sold these bonds to raise a fund to meet those obligations as they came in?

Mr. SHONTS. As they came in.

Senator MORGAN. To anticipate them?

Mr. SHONTS. Some of them were in, and we were holding them up.

Senator MORGAN. But if the Canal Commission had paid you the \$600,000 that they owed you, you would not have had to have sold the bonds?

Mr. SHONTS. Not at that particular time; no, sir.

Senator MORGAN. Or at any other time?

Mr. SHONTS. I do not know how that will work out, whether we will make enough surplus. Six hundred and fifty thousand dollars will not pay \$1,300,000 worth of obligations unless we make money from some place else to make up the difference. How much more we

will have to borrow depends on the net results we get from the operation of the road.

Senator MORGAN. The appropriation that was made for the building of the canal down there had been either so reduced or so expended as that the Commission was unable to pay the \$600,000 to the railroad company?

Mr. SHONTS. That was it.

Senator MORGAN. You sold the bonds in consequence of your inability to collect the debts from the Canal Commission?

Mr. SHONTS. At that particular time; yes, sir.

Senator MORGAN. Those bonds were afterwards repurchased?

Mr. SHONTS. Yes, sir.

Senator MORGAN. From whom?

Mr. SHONTS. From the people who had bought them.

Senator MORGAN. The same people?

Mr. SHONTS. The same people.

Senator MORGAN. They had not passed into other hands?

Mr. SHONTS. No.

Senator MORGAN. Do you know who those people were?

Mr. SHONTS. I do not. I can find out.

Senator MORGAN. Who placed them?

Mr. SHONTS. Mr. Drake made the sale.

Senator MORGAN. At what price did you buy them back?

Mr. SHONTS. The same price, 105. That is the call price of the bonds, Senator.

Senator MORGAN. The call price?

Mr. SHONTS. Yes, sir; what I mean by that is that the mortgage under which the bonds were issued provided that if they were sold they could be called in at any interest-paying date at 105.

Senator MORGAN. That is what you mean by the call price?

Mr. SHONTS. Yes; that is what I mean by the call price.

Senator MORGAN. So that after selling the bonds you could call them in at any time you pleased and pay them off?

Mr. SHONTS. At any interest-bearing date we could determine the mortgage; but these people, the original people, still having them, they turned them back at the same price.

Senator MORGAN. Did they charge any commission for it?

Mr. SHONTS. No; but they charged the interest while the money was gone, of course.

Senator MORGAN. They charged interest?

Mr. SHONTS. Yes.

Senator MORGAN. And so the bonds went out into circulation, and the railroad company paid the interest on them while they were in circulation?

Mr. SHONTS. Yes.

Senator MORGAN. At what rate?

Mr. SHONTS. At the rate of the bonds, $4\frac{1}{2}$ per cent.

Senator MORGAN. Four and one-half per cent?

Mr. SHONTS. Yes.

Senator MORGAN. Do you know the aggregate amount of the interest they paid while they were outstanding?

Mr. SHONTS. No; but the amount of interest it cost the railroad company was more than $4\frac{1}{2}$ per cent for the time they were out,

because the bonds were not sold at 105 per cent plus accrued interest; they were sold at 105 flat, so that the interest from the last interest-bearing date down to the time they were called in had accumulated.

Senator MORGAN. What is the round sum?

Mr. SHONTS. As I recollect it, it was between five and six thousand dollars interest.

Senator MORGAN. So that that was all the loss on this transaction?

Mr. SHONTS. Yes. The difference between $4\frac{1}{2}$ per cent for the time that the bonds were out plus the accumulated interest from the last interest-bearing date was the only amount it was out over and above a $4\frac{1}{2}$ per cent loan.

Senator MORGAN. Why were they recalled?

Mr. SHONTS. The Secretary of War ordered them recalled on the theory that the board of directors, in selling the bonds, had not—he did not decide it, but he said the question might be raised as to whether we had any authority to sell the bonds, because the Government owned the stock, and the question might be raised whether we were not increasing the indebtedness of the Government. I think that was the legal point that he raised.

Senator MORGAN. Did the attorney of the company advise the sale of these bonds, and state that it was legal?

Mr. SHONTS. I do not know that I asked that particular question, right out, but the attorney of the company was present at all of our conferences and knew what we were doing and was in harmony with it.

Senator MORGAN. Was it not practically his plan to sell the bonds?

Mr. SHONTS. No; I do not know that it was, Senator.

Senator MORGAN. Was not that his advice to the company?

Mr. SHONTS. I do not remember of asking him and his saying so formally, but he agreed to the sale of the bonds.

Senator MORGAN. Was the sale ordered by a full meeting of the board?

Mr. SHONTS. The sale was authorized by a full meeting of the board, as I recollect it.

Senator MORGAN. Was the minister from Panama at that meeting?

Mr. SHONTS. I do not know. I will send you the minutes.

Senator TALIAFERRO. I understood you to say, Mr. Shonts, that the attorney had advised you that the directors could make this sale of the bonds.

Mr. SHONTS. I think so. I say I do not remember of asking him directly that question and his answering right back, but I know that he did think so, for he was present.

Senator KNOX. It would not have been done against his opinion?

Mr. SHONTS. Why, no; it would not have been done against his opinion. He was present. I may have the fault of taking too much for granted; but when we sit around in a board meeting and discuss these things, and nobody objects, I take it for granted that they agree.

Senator TALIAFERRO. Was the Secretary of War consulted about the sale?

Mr. SHONTS. No; he was not.

Senator TALIAFERRO. I understood you to say that you were in the habit of sending him copies of all important papers?

Mr. SHONTS. We aimed to.

Senator TALIAFERRO. Were you not also in the habit of consulting him about these large transactions?

Mr. SHONTS. Well, you know, the Secretary of War was away when some of these things were being done. He was not away, of course, when this thing was done; but this, from my point of view, was so clearly a matter within the sphere of the railroad and its directors that it did not occur to me to consult the Secretary of War about that.

Senator TALIAFERRO. In representing the stockholders and acting as a director for a railroad company, Mr. Shonts, in the treasury of which you found several hundred thousand dollars of bonds of the company, and there was one stockholder owning practically 90 or 95 per cent of the stock, would you not feel that you ought to consult that stockholder before putting those bonds on the market?

Mr. SHONTS. Oh, no; because that is not usual. The directors exercise their authority, because they get it from the stockholders.

Senator MORGAN. At that time the United States Government owned every dollar of the stock, did it not?

Mr. SHONTS. Yes; oh, yes; there is no doubt about that.

Senator TALIAFERRO. Except this qualifying stock?

Senator MORGAN. They owned that, too.

Senator TALIAFERRO. They do in a way; yes.

Mr. SHONTS. They have a call on it. But boards of directors get their authority from their stockholders; and if we have bonds in the treasury of any corporation I have been connected with, placed there for any purpose, under the mortgage, and the urgency arises, and the directors see fit to act under their authority, they go ahead and do it without referring it back to the stockholders; but the stockholders afterwards ratify it.

Senator MORGAN. To whom was this \$3,000 of interest charged that had to be paid on these bonds while they were circulating in the market? Was it charged to the railroad company or to the Isthmian Canal Commission?

Mr. SHONTS. It was charged to the railroad company. The question was up whether the Commission ought to pay it or not, and because the determining factor in the sale was the inability of the Commission to pay its debts it really, from one point of view, might have been fair to the Commission to pay it. But I ruled that if the railroad company had not had this obligation it might have had some other bad creditors, and would have had to go in the market anyhow; and I told them to charge it to the railroad company.

Senator MORGAN. Was not the determining factor the fact that the Isthmian Canal Commission was not able to pay its debts?

Mr. SHONTS. Because they had exhausted their appropriation; yes, sir.

Senator MORGAN. They had exhausted all their appropriation?

Mr. SHONTS. Yes, sir.

Senator TALIAFERRO. Mr. Shonts, do you not think it would simplify this work to get rid of this separate management of the railroad and put it all under the management of the Commission?

Mr. SHONTS. No; unless you are going to eliminate commercial business. If we are going to do commercial business over that railroad, I believe that in order to accomplish the best and most economical results the people operating that railroad should be held responsi-

ble, just the same as though they had no connection with the Isthmian Canal Commission.

Senator TALIAFERRO. I am discussing the management, not the operation—not the men that operate the road. I am talking about the management. Do not the Isthmian Canal Commission practically manage that property now?

Mr. SHONTS. The same men do; but I know that it is my purpose, and I know that it is the purpose of Mr. Stevens, who is on the ground, to keep them entirely separate and distinct.

Senator TALIAFERRO. Could not one purchasing agent do the work for both?

Mr. SHONTS. Oh, they do.

Senator TALIAFERRO. And one auditing department?

Mr. SHONTS. They do, with the different local men under them. I went into that when I was on the stand at first.

Senator TALIAFERRO. In your testimony before?

Mr. SHONTS. Yes, sir; you were not here when I did that.

Senator MORGAN. Suppose, Mr. Shonts, that it should unfortunately turn out that this \$3,000 of interest had been received by these gentlemen who are on the board of directors and paid out to the company, and that they should be personally liable for it, because they did not have any right to do it—would that obligation involve also the minister from Panama?

Mr. SHONTS. That is a legal matter that I will not undertake to pass on.

Senator MORGAN. Exactly the same question arises about the payment to Mr. Markel?

Mr. SHONTS. Yes, sir.

Senator KITTREDGE. Since you testified two weeks since, have you kept in touch with the condition of freight congestion at Panama?

Mr. SHONTS. Yes, sir.

Senator KITTREDGE. What is your understanding of the condition to-day?

Mr. SHONTS. I have a recent letter from Mr. Stevens here on that subject.

Senator KITTREDGE. Of what date?

Mr. SHONTS. February 15.

Senator KITTREDGE. I wish you would read it.

(Mr. Shonts thereupon read aloud the following letter, which, by direction of the committee, is printed as part of the record:)

PANAMA RAILROAD COMPANY,
OFFICE OF GENERAL MANAGER,
Panama, February 15, 1906.

Mr. T. P. SHONTS,

*President Panama Railroad Company,
Mills Building, Washington, D. C.*

DEAR SIR: I wrote you by last steamer, sending you statement of delays of the Pacific Mail steamships at the port of La Boca from June 1 to December 31, 1905, this statement being made up from actual records.

I find, in digging into the records a little further, that there are still other points along the same line to our credit, as follows:

City of Panama arrived June 18. A delay of two days is marked on the statement, but no time whatever was lost, as she was worked in exactly nine days.

City of Sydney arrived September 19. She was worked in eight days, or one day less than the scheduled lay over.

Peru arrived September 30. She was worked in eight days, gaining one day over the scheduled lay over.

San Jose arrived October 10; worked in eight days.

Acapulco arrived October 25. Although six days are marked in the statement as lost, three of these days, November 3, 4, and 5, were local holidays; and as the Pacific Mail could not get the men to work their ship, the fault lies with them, there being really only three days lost above the scheduled lay days.

City of Para arrived October 28. The statement reads eight days when it should be seven instead.

Of course, where we work a ship in less than the regular lay-over of nine days, it does not affect their schedule; but I merely note it to indicate that our men have been entirely alive to the situation and handled it with good dispatch.

I will merely say that undoubtedly Mr. Schwerin's testimony was gotten from evidence which had come to him improperly. His statements are biased, will not stand investigation; and when he says that we are utterly neglecting commercial business on the Panama Railroad to handle the Commission's business, he is talking without warrant, as there is no such intention, and no such policy has been pursued.

As I cabled you this morning, we are now in the height of what is probably the heaviest coffee season for at least ten years, and to-day there is not a ton of delayed freight for any destination whatever on the Isthmus; and our old Panama Railroad employees, who have been here through the past régime for many years, unite in saying that never has the business of the Panama Railroad and docks been handled so entirely successfully as it has been the past two or three months and is now being handled.

Mr. Bierd and myself have the situation entirely in hand, and I am now arranging to give him some more assistance, as he has been carrying a heavy burden. But it has been a one-man proposition as far as details are concerned. I have no regrets to express and no excuses to offer. I consider that the situation has been well handled.

Truly, yours,

JNO. F. STEVENS,

Vice-President and General Manager.

Senator MORGAN. The business of the railroad, of course, is "brisking up"—increasing?

Mr. SHONTS. Yes, sir.

Senator MORGAN. Owing to the coffee trade?

Mr. SHONTS. Yes, sir.

Senator KITTREDGE. In that connection I am going to ask to go in the record some correspondence had between myself and the Pacific Mail Steamship Company. A few days since I asked them the same question that I asked you, Mr. Shonts, resulting in correspondence. Shall it be read or put in the record?

The CHAIRMAN. If it is the desire of the committee, it may be read.
(Senator Kittredge thereupon read aloud a portion of the following correspondence, all of which is, by direction of the committee, printed as a part of the record:)

PACIFIC MAIL STEAMSHIP COMPANY,
120 Broadway, New York, March 1, 1906.

Hon. A. B. KITTREDGE,
United States Senate, Washington, D. C.

DEAR SENATOR KITTREDGE: I inclose you herewith original correspondence which I received from our special agent, Mr. A. M. Garland, in charge of our agency at Panama, with the hope that you may find time to read it and return it to me at your convenience.

While the controlling officers at Panama have my sincere sympathy, it does look as though it were about time that they got some system in their work in order to avoid the intolerable situation we are now compelled to meet.

The result of our operations for the past six months shows a heavy loss, and it certainly seems unfortunate this should be brought about through people who are employees, directly or indirectly, of the United States Government.

Yours truly,

R. P. SCHWERIN,
Vice-President and General Manager.

PACIFIC MAIL STEAMSHIP COMPANY,
Agency, Panama, February 15, 1906.

R. P. SCHWERIN, Esq.,
Vice-President and General Manager,
Pacific Mail Steamship Company,
No. 120 Broadway, New York City.

DEAR SIR: Referring to the above-mentioned and inclosures contained in my "confidential" letter relative thereto, next attached, please find copy of telegram and letter dispatched after my letter to Mr. Hunt on the 10th instant, in connection with loading of our steamships *City of Sydney* and *Peru*, which are self-explanatory.

After trying repeatedly without success to obtain some definite information from Freight Agent Hunt regarding whether his line would be able to deliver the freight ordered for these steamers in time to dispatch them on schedule dates, particularly that ordered for the former, and there still remaining a large portion of the cargo to come over the road from Colon, I deemed it imperative to communicate the facts to General Manager Stevens and necessary to wire Superintendent Bierd fully in the premises, in order that both gentlemen might be fully aware of the actual conditions existing at La Boca; also that their company, as well as ours, was being subjected to a great deal of unnecessary expense, through the manner in which the freight was being loaded in Colon.

Up to this writing have no replies from either, although I understand latter came over the road "special" at 8 a. m. on the 14th,

and upon his arrival at the "Lumber" wharf found about 60 Panama Railroad Company laborers resting themselves on hand trucks, with no foreman whatever in evidence, and the work for both account of our and their company at a standstill in consequence. Mr. Bierd endeavored to order some of the men about, but was promptly informed by one of the gang, not knowing who he was: "We don't take no orders from you; we belong to the Panama Railroad Company's gang." Leaving there he proceeded to the La Boca wharf proper, where he found a similar condition of affairs, and after talking a lot about what ought to be done went away without accomplishing anything. I understand, however, that he made some remark about having received my telegram, to which he intended replying by letter.

On the afternoon of the 13th, *City of Sydney* sailing date, there were 30 cars of her outward cargo run in on the La Boca wharf, making it impossible, on account of way the freight was mixed up, for the vessel to get away on schedule, although by working that evening, cleaning up the shorts, we succeeded in getting her away at 4.30 p. m. on the 14th, full up.

Same afternoon, on my way in from La Boca, during a heavy rain-storm, I counted 34 flat cars loaded with *Aztec* and *Peru's* coffee, also bales and case merchandise for Central American ports and San Francisco, standing in the open, without any protection whatsoever, and the water running off of them in streams, in view of which have given commanders and pursers particular instructions regarding their exceptions.

This morning received a cable from San Jose announcing the arrival of the *Dulwich* at Ancon on the 19th, with 50,900 coffee, 4,300 hides; also of the arrival of S. S. *San Juan* on the 18th, with 10,600 coffee, and as we are expecting the S. S. *Barracouta* with 975 tons of through cargo on the 17th, and from the fact that the S. S. *Peru* is alongside loading for Central America and San Francisco, and the S. S. *Newport*, which arrived on the 13th, with 6,500 bags, discharging her inward cargo, it would appear to be about time Messrs. Stevens and Bierd woke up to the realization that they will have to make a strenuous effort to move our cargo and make some radical changes in their management of affairs, or else we are going to be hopelessly tied up in the near future.

Inclosed herewith also please find press copy of Captain Kidston's report under caption "Discharge and Loading of Pacific Mail Steamship Company's Steamers at La Boca Wharf," as well as with regard to the general situation, which I am sure will be of interest and trust will be of service.

I have about given up all hope of getting the *Peru* away on a special run via Central American and Mexican ports to San Francisco, but will do everything possible to keep our lines clear and the vessels moving.

With nothing further at present, I am,

Yours, truly,

A. M. GARLAND,
Special Agent.

PANAMA, February 13, 1906.

W. G. BIERD,

Superintendent Panama Railroad Company, Colon:

Notwithstanding that the loading orders for our *City of Sydney* were placed in your Mr. Hunt's hands under date of the 5th instant, her sailing to-day on schedule date will be delayed on account of the inability of your line to deliver the cargo, particularly that ex *Constantia*.

On Monday morning your pay car arrived at La Boca, and while we were compelled to keep four gangs standing by on board both the *S. S. Peru* and *Sydney*, very little was accomplished, because your gangs deserted the work to get their wages, and the whole day was practically lost on that account.

Will you please investigate and inform me by wire whether the balance of the *Sydney's* cargo will arrive at La Boca to-day, and if not, when we may expect it, as I am very anxious to get the steamer dispatched?

As indicated in my letter addressed to your Mr. Hunt on February 10, with carbon copy to you, the delay in loading our vessels is further aggravated after the arrival of the cargo on this side through the loading of your cars in Colon with mixed destinations, and including freight for ports at which our steamers are not scheduled to call, making it necessary for your company to rehandle, sort, and reload a lot of cargo at La Boca, which with the limited space causes great congestion and confusion, makes the checking and delivery more difficult, and causes a great deal of unnecessary expense to your company on account of the extra handling and to mine on account of the detention of the steamers and the extra time we are compelled to keep the laborers engaged.

It is imperative that the *S. S. Peru* should be loaded and dispatched special with the least possible delay. The orders for the freight were placed in your Mr. Hunt's hands on February 8, and I will appreciate it greatly if you will kindly instruct your freight agent at Colon to see that special care is taken in the loading of the *Peru's* cargo, and to avoid sending any freight forward for ports at which she does not call, in the cars with her cargo, and which was formerly the custom in vogue.

Please inform me also whether the amount of cargo ordered forward by these two steamers has been more than you can conveniently handle during their lay days, and if so, I will endeavor as far as the available tonnage will permit to shrink the amount of freight going forward by each steamer, if it will assist your operations any.

Awaiting the favor of your reply, I am,

Yours, truly,

A. M. GARLAND,
Special Agent, Panama R. R. Co.

FEBRUARY 13, 1906.

JOHN F. STEVENS, Esq.,

General Manager Panama Railroad Company, Panama.

DEAR SIR: Referring to the above mentioned, attached, please find copy of my telegram of even date, addressed to your Superintendent Beird at Colon, which is self-explanatory.

I will esteem it a great favor if you will have the kindness to investigate and give necessary orders to correct existing conditions as soon as possible, thereby affecting a great saving in the operation of both your as well as this company, to say nothing of facilitating the handling and transportation of the freight passing over our respective lines.

Will you have the kindness to inform me what you decide to do in the premises. I am,

Yours, truly,

Special Agent.

PACIFIC MAIL STEAMSHIP COMPANY,
La Boca, February 14, 1906.

A. M. GARLAND, Esq.,

Special Agent Pacific Mail Steamship Company, Panama.

SIR: I beg to submit the following report for your consideration, regarding the handling of cargo to and from the ships of this line at the La Boca wharf:

First. The careless manner in which cargo is loaded on cars at Colon for the ships at La Boca wharf, some cars coming on wharf with three to four destinations in them and, the destinations which are wanted for ship loading being in both ends of the car, it becomes necessary to remove all cargo from car in order to get at cargo wanted, the cargo not wanted being placed in a pile on wharf, which gets so large that two trucks can hardly pass each other without having a collision. It also frequently happens that cars billed as having cargo in that is wanted by our steamer loading, when switched in upon wharf and opened are found not to contain cargo as billed.

Second. The lack of sufficient cars to handle cargo while discharging is another great source of delay, as though not having sufficient cars it becomes necessary to pile cargo on the wharf, which blocks it and also makes truckers go a roundabout way to get to the piles where they are piling cargo. At times it becomes necessary to take cargo in ship before the work of discharging is completed, this being done to facilitate work on wharf by giving empty cars or clearing wharf as well as to hasten departure of steamers. This taking on board of cargo at times before discharge is complete is extra expense to the company, as in most cases the freight has to be restowed. Frequently it becomes necessary to stop work on steamers, as wharf is so overcrowded as not to have room to receive more cargo, this stoppage lasting as long as it takes them to make space by loading any empty cars they may have; another drawback is the lack of equipment on wharf. For instance, in working *Sydney*, voyage No. 86, with 86 men working on wharf, they had but 16 hand trucks with which to handle cargo from cars to derrick tackle, and it is a frequent occurrence that we have to wait for cargo through their not having sufficient trucks.

Third. The lack of wharf room (especially the old wharf) to work men to advantage in order that cargoes may be handled quickly is another great disadvantage that has to be contended with here on old wharf. The space between string piece and car track is so narrow that after 40 or 50 tons have been piled on wharf, to get at destinations

required there is so little space left as not to leave room for two trucks to pass each other, and they get locked and cause a blockade for ten minutes at a time.

Fourth. The very inferior quality of labor employed to handle cargoes on the wharf. This labor is composed for the most part of West Indian negroes of the most ignorant and lazy type, and for the most part nearly all under contract to Panama Railroad Company; so that, work or play, so long as they are on the wharf their pay goes on. They pay no attention to the orders of the foremen, who are mostly all of their own race and know but very little about the work in hand themselves.

Fifth. The utter disregard to system or organization of the working force engaged as labor is very great, as you know the working hours at which pay begins are from 6 to 11 a. m., and from 1 to 6 p. m., but work is carried on as follows, viz: Train arrives with labor from 5.40 to 6 a. m.; then the work of taking their time begins, so that by the time that this has been gone through and the men are ready to work it is any time between 6.35 and 7 a. m. before any cargo has passed between ship or wharf; at 10.45 work ceases for the forenoon, which I presume is done in order to allow labor to get on board train to go into Panama for dinner; at 1 p. m. train arrives with labor and same process of time taking has to be gone through as in the morning, so that by the time work is under way again it is generally from 1.40 to 2 p. m.; at 5.45 work ceases for the day in order that labor may board train, so that you will see that by this process in the regular working day of ten hours the Pacific Mail loses on an average two and one-fourth hours each man per day, as our labor are ready and on ship doing nothing, for which their time goes on as though they were working.

When night work is necessary, which has been all the time heretofore, work is supposed to commence at 7 p. m., but in my experience since I have been here that Panama Railroad has never been able to commence work before 8 p. m. If labor is slow and unsatisfactory during the day it is doubly so during the night. The railroad company takes on as high as 85 to 90 men, working one ship at night and one white foreman is in charge of this gang. His time being taken up in sorting and hunting for freight in cars leaves nobody to look after the negro, so he sits down. I have personally checked up, while loading the *City of Sydney*, voy. No. 86, 70 men taken on and start work for railroad at 8 p. m., and at 10 p. m. have checked up the men again, and all that I could find were 42. I counted 23 asleep on piles of freight on wharf and in cars; consequently night work is of very heavy expense, and so very unsatisfactory that from 30 to 40 tons of freight is all that we could get in ship in four hours working time, and in consequence of which I have cut out a great deal of night work on steamers *Sydney* and *Peru*, and I also strongly advise not doing any night work at all on these ships under the present conditions.

February 12 at 10 a. m. Panama Railroad Company's pay car arrived at wharf and began paying off labor, which caused stoppage of work for two and one-half hours on both steamers *Peru* and *Sydney*. Pay car stopped paying between the hours of 11 a. m. and 1

p. m., at which latter hour paying was resumed and continued during the rest of the day.

Attached please find statement of actual time lost during working of steamship *City of Sydney*, voy. No. 86, from February 5 to February 14, inclusive.

Very respectfully,

WILLIAM KIDSTON,
Outside Superintendent.

Actual time lost on S. S. City of Sydney, voyage No. 86, while loading and discharging cargo at La Boca pier.

Date.	Gangs.	Number men.	Time lost each man.	Total time lost
			<i>Minutes.</i>	<i>h. m.</i>
February 5, a. m.	2	26	15	6 30
p. m. n.	3	36	20	12 00
6, a. m.	3	36	20	12 00
p. m.	4	48	35	28 00
p. m. n.	3	36	40	24 00
7, a. m.	4	48	30	24 00
p. m.	3	36	45	27 00
p. m. n.	3	36	40	24 00
8, a. m.	4	48	30	24 00
p. m.	4	48	40	32 00
9, a. m.	4	48	40	32 00
p. m.	4	48	35	28 00
10, a. m.	4	48	40	32 00
p. m.	1	12	30	6 00
p. m. n.	4	48	40	32 00
11, a. m.	4	48	40	32 00
p. m.	2	24	40	16 00
p. m. n.	1	12	50	10 00
12, a. m.	4	48	40	32 00
p. m.	4	48	100	80 00
p. m. n.	4	48	60	48 00
13, a. m.	4	48	40	32 00
a. m.	2	24	80	82 00
p. m.	4	48	40	32 00
p. m.	2	24	30	12 00
p. m. n.	4	48	50	40 00
14, a. m.	4	48	50	40 00
Total			1, 120	749 30

a Waiting for cargo.

b Labor train wrecked.

c Pay car.

d Waiting car.

Actual working time lost, 1 day 18 hours 40 minutes.

Night work, 148 hours, at 40 cents per hour..... \$59. 28

Day work, 601 hours 30 minutes, at 24 cents per hour..... 144. 36

Total, 749 hours 30 minutes (Balboas)..... 203. 56

Very respectfully,

Wm. KIDSTON,
Outside Superintendent.

PACIFIC MAIL STEAMSHIP COMPANY,

EXECUTIVE OFFICES,

120 Broadway, New York, March 5, 1906.

Hon. A. B. KITTREDGE,

United States Senate, Washington, D. C.

MY DEAR SIR: I beg to acknowledge receipt of your letter dated March 3, and confirm my telegraphic reply thereto of to-day, as per confirmation herewith inclosed.

In accordance with my telegram now beg to hand you herewith a letter from Mr. Garland, dated Panama, February 11, together with prints of the four negatives referred to therein; also a copy of a letter written by Mr. Garland to Mr. J. St. C. Hunt, port captain and freight agent of the Panama Railroad Company, under date of Panama, February 10. Would call your particular attention to the third paragraph of last-mentioned letter, where Mr. Garland points out that owing to the mixed condition in which cargo was loaded into cars, it was necessary to shift cars from the American wharf, Panama, to La Boca, and vice versa. As the distance between the American wharf and La Boca is about 3 miles, you will appreciate the unnecessary expense incurred by the Panama Railroad Company in making these moves.

You can use the inclosed correspondence and photographs as you see fit. As these are the original papers belonging to my files, would appreciate if you would return them to me at your convenience.

Yours, truly,

R. P. SCHWERIN,
Vice-President and General Manager.

PACIFIC MAIL STEAMSHIP COMPANY,
Panama Agency, Panama, February 11, 1906.

DEAR MR. SCHWERIN: Inclosed herewith please find four negative prints, from which will give you a fair idea of the manner in which the freight is now being transported across the Isthmus. Mr. Pearne tells me he saw a flat car loaded with cases and bales of merchandise, with sacks of stearine stowed on top, dripping from exposure to the sun, and running down and saturating the packages underneath.

A few days ago a flat car loaded with furniture and other general cargo, with bales of oakum, waste, and wicking on top, was set on fire with sparks from the locomotive, and after the train had been cut in two to sidetrack those on fire they were left to burn up.

I hope to get a collection of pictures that will interest you in this connection, and trust they will prove of service.

Understand shippers and consignees in Central America have heard of this manner of freight transportation, and the interests of the route will undoubtedly be greatly prejudiced thereby, to say nothing of chances for robbery and other damage to the cargo now passing over the Isthmus.

I am, your, truly,

A. M. GARLAND.

[Dispatch of City of Sydney and Peru.]

PANAMA, February 10, 1906.

J. ST. C. HUNT, Esq.,

P. C. & F. A., Panama R. R. Co., La Boca Wharf.

DEAR SIR: Replying to your file 40 and 115 of the 9th instant, with regard to the dispatch of the above-mentioned steamers, please be advised that it is imperatively necessary that the former should get

away on the 13th, and in view of the arrival of the *Newport*, *Barra-couta*, and *Dulwich* within the coming week also we are very desirous of dispatching the *Peru* special just as soon as the cargo already allotted can be delivered and loaded on board.

We will appreciate it as a great favor if you will arrange to deliver these cargoes as quickly as possible, and assist our work of loading, and lessen the general expense caused by the delay and rehandling of the cargo alongside our vessels by requesting your Colon freight agent to be more particular and to stow the cargo according to destinations separately when loaded on or into your cars.

The loading of both our steamships *Aztec* and *Hounslow* were both considerably delayed recently on this same account, for although you were advised considerably in advance with regard to just what cargoes both steamers would accept the freight for both steamers, one loading at La Boca wharf and the other at Isle de Naos, by way of the American wharf, were loaded on the same cars in many instances, to a considerable expense for account of our joint interest through the unnecessary amount of switching and delay.

A brief review of the amount of cargo awaiting shipment and for which we have received papers at this writing develops only about 1,200 tons for our line, while with the three steamers about due we will have over 10,000 tons space available, and I will be greatly obliged if you will kindly inform me at your earliest convenience what the prospects are for your line providing sufficient cargo to meet the tonnage offering.

I am, yours, truly,

_____,
Special Agent.

WESTERN UNION TELEGRAPH COMPANY,
New York, March 5, 1906.

Hon. A. B. KITTREDGE, *United States Senate, Washington, D. C.:*

Your letter third. You have my full permission to use letter as you see fit. Sending you to-day special delivery two additional reports from Mr. Garland and photographs.

R. P. SCHWERIN.

(Confirming telegram of this date.)

Mr. SHONTS. If you will permit me, Senator, right in that connection, in order to save your time and at the same time to give you a rather exhaustive review of this subject, I have prepared (and all this is a copy of the files to prove it all) a complete statement covering, first, the general policy that the Panama Railroad Company has used, a statement as to the causes of the congestion, and a statement of what is necessary to provide a remedy. Now, if you are interested in this, I would like to have this go in the record.

Senator KITTREDGE. I have not the slightest objection.

Mr. SHONTS. Because it is made up from the records, and it is subject to verification by any person that you may send to the Isthmus to look into that point.

The CHAIRMAN. Have you that prepared ready to hand to the stenographer?

Mr. SHONTS. Yes; it is ready to hand in. There is a lot of it, but—

The CHAIRMAN. If there is no objection, you can hand it to the stenographer and let it go in the record just as you have it.

Mr. SHONTS. As near as I can get at it, the source of the trouble down there, or one of the sources of trouble down there, has always been friction between Mr. Pearne and Mr. Hunt. I said to Mr. Schwerin the other day personally: "It seems to me that in addition to all these are causes that we know exist—the lack of facilities on the part of the railroad and lack of equipment, which we are overcoming very rapidly, lack of enough ships and proper size of ships on your part—that there should be a better system of advices, and we ought to force our men to work together more thoroughly." He agreed with me, and I asked him to write me a letter; and he said that Mr. Pearne was coming up and he would have a conference with him. But I do not know whether you want me to read my summary. I would not undertake to read all of this.

Senator KNOX. It is not likely that we can, by any legislation, regulate those things down there, is it?

Mr. SHONTS. It has got to be worked out.

Senator KNOX. It has got to be worked out by yourselves?

Mr. SHONTS. Yes, sir; that is the theory.

Senator KITTREDGE. Mr. Shonts, the purpose of my question was this: As I understand, there have been suits in large amounts filed against the railway company, or claims made, on account of the delays and the conditions which you and Mr. Schwerin describe.

Mr. SHONTS. Yes, sir.

Senator KITTREDGE. That is true, is it not?

Mr. SHONTS. Yes; that is true.

Senator KITTREDGE. Do you remember what amount is involved in those suits?

Mr. SHONTS. No. I was told that suits had only been brought to the amount of about \$20,000, but that there was a large number of claims back of that.

Senator KITTREDGE. Claims amounting to what sum?

Mr. SHONTS. Running into large sums, so Mr. Cromwell told me.

Senator KITTREDGE. Several hundred thousand dollars?

Mr. SHONTS. Well, he said very large sums; yes.

Senator KITTREDGE. About how much? What is your impression about the amount?

Mr. SHONTS. I imagined from what he told me that if these claims on which suits have been brought were substantiated there would be a very large amount of similar claims, running into large sums of money.

Senator KITTREDGE. A million dollars?

Mr. SHONTS. I do not know whether any sums were mentioned by him or not. This was only told me on Sunday up at my house. It is the first report I have had on the subject.

Senator KITTREDGE. I will state, Mr. Shonts, that my purpose in presenting this correspondence is not with any idea of accomplishing anything by getting up a contradiction, but to indicate my notion of the importance of cleaning up that situation, so that the railway company and, indirectly, the Government will not have these bills to pay.

Mr. SHONTS. I think that is very wise; and now, if you will permit me, I will state that there is no doubt that there have been very serious delays there. There was an accumulation there when we got there in July. I have been told since that some of the stuff had been lying there for months prior to that time, so much so that the marks were lost, and they had to do all sorts of things to get rid of it. They have had to get some of those southern steamship lines to take it with the best marks they could and try to get rid of it, if they guessed right as to the consignees; and the company has offered to guarantee the steamship lines against loss if they made a mistake, it being better to do that than to sell it for what they could get for it there.

There is no doubt that that congestion will cost a lot of money; but we all know the causes of the congestion. We all know that the old Panama Railroad management spent no money on their terminals or their wharves or their cars, etc.

There were some things in Mr. Schwerin's testimony that I know were misleading—for instance, where he speaks of the volume of business. I do not know where he got his figures, but I have gone into that matter very carefully, and I give you in this statement the real, actual tonnages shown by our statistics, which are probably five times what they were a year ago.

Why, even if those facilities had been in good repair, which they were not, and if they were not ample for the old business, you could not help but have a very great congestion when you put five times the amount of business in on top of it. So that Mr. Stevens and Mr. Bierd, the men that found this condition existing there, who had to create the enlarged facilities themselves to put themselves in better shape, and in the meantime work out this, deserve a lot of credit, in my judgment. They deserve great credit for working out of it with the same old facilities and getting cleaned up as they are now, according to this letter, which is absolutely true, I have no doubt; and they are now prepared to take freight on a larger basis and handle it all more expeditiously and more economically.

Senator KNOX. One of the advantages, then, to the public in having this railroad operated under its own charter and independently of the Commission is that the public can obtain redress in the ordinary way in the courts for any delay or damage that they may sustain by reason of the wrongful acts of the railroad?

Mr. SHONTS. The same as against any other common carrier.

Senator KNOX. So that they would not have to sue the Government, which they could not do, of course, without special authority?

Mr. SHONTS. No.

Senator TALIAFERRO. If we can do nothing by legislation to correct these conditions, why should we encumber our records with all this matter? Is there any special object in it?

Mr. SHONTS. The reason I ask for it is this: I believe that I have demonstrated that I am not here to try to bolster any person up or to tear any person down; but the only reason I ask for this is because Mr. Schwerin's statement and figures, etc., are in the record, and I think that the figures and statistics taken from our books and in regard to our own business should be put in the record as long as that other matter remains in. That is all.

Senator TALIAFERRO. You mean, the other matter being in the record, you think that the railroad company ought to be allowed to reply to it?

Mr. SHONTS. Yes; that is the point. But this was not written with any idea of controversy at all, but simply to state the facts as we found them, taken from our own books.

Senator KITTREDGE. The fact that all these suits have been brought and the claims are pending indicates that there is trouble on the part of the railway company?

Mr. SHONTS. There was; there was serious trouble, Senator. I do not believe it exists to-day.

Senator KITTREDGE. You mean that that condition has been entirely relieved?

Mr. SHONTS. I believe exactly what Mr. Stevens says in his letter of the 15th—that on that date there was not a ton of accumulated freight waiting for any shipment.

Senator KITTREDGE. And that condition has continued since last December, as I recollect the date you gave?

Mr. SHONTS. Oh, no; this was written on the 15th?

Senator KITTREDGE. I mean, as I recollect your testimony—probably it was Mr. Stevens who said it—since some time in December freight had moved freely and satisfactorily?

Mr. SHONTS. It has. They were cleaned up, practically, in December. Then there was a little accumulation, because the Pacific Mail Steamship Company took two steamships out light and canceled the sailing of a third steamship, and that was what really caused this controversy to come before your committee; and we were afraid, and, in fact, knew, that if that policy was pursued we would have another congestion. That is what brought up this question. But now, as late as February 15, Mr. Stevens writes that on that day there was not a ton of freight waiting.

Senator KNOX. Where we get bewildered is in the different deductions drawn from the same state of facts. What you call a little accumulation they come in here and describe as a great congestion, and we do not know where we are about this thing.

Senator KITTREDGE. That is true.

Senator KNOX. I am in favor of letting you print your reply to the other matter.

The CHAIRMAN. I do not see why it should not go into the record.

Senator KNOX. Do you not think so, Senator Taliaferro?

Mr. SHONTS. I do not mean to burden you with it; but it seems to me that it just balances the thing up.

Senator TALIAFERRO. I think we ought to reach a point where we are going to stop having that kind of matter.

Senator KITTREDGE. That is true, of course.

(By direction of the committee, the papers referred to are printed as a part of the record, and the same will be found at the end of to-day's proceedings.)

Senator KITTREDGE. To what extent is the Canal Commission making purchases in the open market to-day?

Mr. SHONTS. What do you mean by "open market?" Without advertising?

Senator KITTREDGE. Without advertising.

Mr. SHONTS. Oh, very slightly; nothing except in great emergencies. We are even advertising for thousand-dollar requisitions, whereas, under the order of the President, we have a right to buy them in the open market. We buy nothing, Senator, without some sort of bids. We never have done so without some sort of bids, some competitive bids; but we did not always advertise when we were trying to get caught up.

Senator KITTREDGE. I am speaking of, say, within the last thirty days—since February 1st?

Mr. SHONTS. Oh, well; it is very small.

Senator KITTREDGE. Will it be much trouble for you to make a statement to us of the amounts and a description of the articles purchased in open market?

Mr. SHONTS. Since February 1st?

Senator KITTREDGE. Yes.

Mr. SHONTS. No, sir.

Senator KITTREDGE. Without competitive bids or advertisements—will that be much trouble for you?

Mr. ROSS. No, sir; I do not think so. It will take a little time, a day or two to make it up; but it can be done all right.

Senator KITTREDGE. To what extent has the Panama Railway Company, during the same period, made purchases in the open market without competitive bids?

Mr. SHONTS. I will have that statement made for you, Senator. I could not answer offhand just to what extent.

Senator KITTREDGE. And to what extent have requisitions been made through the Panama Railway Company during the past thirty days for material to be used by the Commission, if any?

Mr. SHONTS. I will have that made up for you.

Senator KITTREDGE. And can you send the committee copies of those requisitions?

Mr. SHONTS. Yes.

Senator KITTREDGE. Do you have them here at this office, or are they at New York?

Mr. SHONTS. Yes; they come here.

Senator KITTREDGE. And is there any way to determine from the requisitions whether they are for the use of the railway company or for the Canal Commission?

Mr. SHONTS. They should state.

Senator KITTREDGE. Do they in fact state?

Mr. SHONTS. Well, so far as I know, they do. I do not see all of them, you know; but so far as I know they do. I would be very glad to have you ask Mr. Ross about that, because he does know. They all come to him.

I will state, Mr. Chairman, that "Mr. Vernon Brown" was the name of that gentleman that I spoke of—the general agent of the Cunard Line.

The CHAIRMAN. I could have told you that if you had asked me.

Mr. SHONTS. Now, I only have one other matter here, and it is for you gentlemen to say whether it is worth while to put it in or not.

The CHAIRMAN. What is it, Mr. Shonts?

Mr. SHONTS. Mr. Wallace, in his testimony, made an argument in regard to the adoption of a flat rate. I knew that was in his mind

when I came with the Commission, and I have made a good deal of a study of that since, and these are my views, if you care for them; that is all.

Senator KNOX. I move that Mr. Shonts be given leave to print.

Mr. SHONTS. That is all. Now, it depends upon how much of an impression Mr. Wallace's testimony might have made on that subject.

Senator TALIAFERRO. His testimony is in there, and you want to meet it. I think it is very proper that your views should go into the record.

The CHAIRMAN. Mr. Wallace will be here again. I do not know whether he will want to have leave to print then or not.

(The papers above referred to, by direction of the committee, are printed as a part of the record, and the same will be found at the end of to-day's proceedings.)

(At this point a letter was handed to Mr. Shonts by Senator Taliaferro.)

Senator TALIAFERRO. Tell the committee about that, will you, Mr. Shonts?

Mr. SHONTS. Yes; I have in my hand a memorandum inclosing some correspondence between Mr. A. L. White and Senator Foraker. Mr. White asks Senator Foraker to write me a certain letter and send me a certain telegram, which Senator Foraker declines to do, but writes another one, and Mr. White's reply to that is given, in regard to the purchase of locomotives.

We were in the market under general specifications prepared by Mr. Stevens for 120 locomotives, 100 being smaller, and to be used, as I think Mr. Stevens has probably explained to you, on the tracks in the cut leading out to the main line; and the 20 heavier ones to handle the material and pull the full trains from the yards out to the dumping grounds. We advertised and got bids from the American Locomotive and the Baldwin people, and these gentlemen came to see me. They admitted that their locomotives did not comply with our specifications, but insisted upon trying to convince us that their locomotives were more nearly adapted to what we wanted than the specifications that Mr. Stevens had prepared.

I said to them: "We have a general rule that I do not believe Mr. Stevens will vary from, but I do not know. That is, that Panama is so far from the base of supplies that we do not experiment much. We only adopt the approved and tried and known things. Now, you may have a locomotive that is very excellent, but we do not know that it is excellent. Mr. Stevens is on the ground and he is responsible for results; and I would not think it was fair to require certain results from him and to force him to use any certain tools or any certain men. He should have a free hand in regard to those matters. If he is given the responsibility he should have the authority." And these gentlemen insisted that I should communicate that to Mr. Stevens; and I said: "Very well." They said if I would send a cablegram that they would write they would pay for it. "Well," I said, "you write your cablegram and I will look at it." They wrote it, and I sent it substantially as they prepared it, but not quite, because they did not have my hearty indorsement in it. As I remember, it was something that would tend that way, and I could not

heartily indorse it; but I stated the facts, and with that amendment I sent the cablegram to Mr. Stevens.

Senator KITTREDGE. What was the substance of the cablegram?

Mr. SHONTS. The substance of the cablegram, as I recollect it, was urging that these engines were particularly adapted to certain work—spoiling work—and that certain roads, as I recollect it, used them. I think they quoted the names of some roads—two or three roads—that used their locomotives. Mr. Stevens promptly answered that he wanted the other locomotives that he had prepared specifications for; so that was all there was about it. Whenever we advertise for bids and make our specifications, if the people do not bid on our specifications, of course we can not very well consider their bids.

Senator TALIAFERRO. This was a character of locomotive that you thought would not be useful on the Isthmus?

Mr. SHONTS. It was a new feature; it was a new departure. We were not familiar with it. Mr. Stevens was not familiar with it, and he did not want to experiment with it, and it did not comply with our specifications. Now, the specifications (if you will permit me in that connection, Senator) were so open that if these gentlemen wanted to build locomotives we would have been glad to receive their bids for the construction of locomotives on those specifications. But that was not their object. Their object was to have us abandon a type that we were asking for bids for and have their type adopted instead.

Senator TALIAFERRO. In purchasing shovels, do you remember about the first lot that was bought—whether they were advertised for or not?

Mr. SHONTS. I was not here then at all.

Senator TALIAFERRO. I am through with Mr. Shonts.

Senator KITTREDGE. Mr. Shonts, the newspapers have, during the last summer or fall, or perhaps the early winter, advised us that there was complaint because the specifications were so prepared as to preclude more than one bidder. Do you remember seeing any statements to that effect?

Mr. SHONTS. No; I have not. I do not remember of seeing statements of that kind in the press, but I have heard an occasional complaint of that kind. When we came here, I think you will remember that I explained, things were congested here as well as everywhere else; things had accumulated, and there was no organization. We went to work as fast as we could, in addition to the current work of formulating rules governing each department, and I went into that question very thoroughly of requiring the people on the Isthmus that wanted to use these tools to prepare specifications based on such lines as would preclude any proprietary or any particular thing from being called for, unless there was some proprietary article that they thought so much of that they were willing to ask for it on their own authority and assume the responsibility for it.

If for any reason which they wanted to give they asked for any particular proprietary thing, they would have to state it and state the reasons for it and assume the responsibility for it. I think perhaps our rules have been introduced—I was told that they had been introduced—in your testimony. But we have undertaken to require the preparation of all specifications on such broad lines as that, while

they would get the tool or whatever it is that was asked for, they would at the same time permit every person interested in that line to bid on them.

Senator KITTREDGE. And I understand that it is possible to so prepare specifications as to accomplish the result that some of these people claim, but as a matter of fact your specifications are not so prepared; is that the point?

Mr. SHONTS. Why, I do not think they are. No particular case has ever been brought to my attention.

Senator KITTREDGE. Has any complaint of that character ever been presented to you or the Commission?

Mr. SHONTS. Not that I remember of, Senator.

Senator TALIAFERRO. I want to get Mr. Shonts to tell the committee about that trouble that the laborers had with the Panamanian police last April in the streets of Panama.

Mr. SHONTS. I was not there then. I can only tell you from hearsay. Governor Magoon can tell you about that.

Senator TALIAFERRO. Was it reported to you?

Mr. SHONTS. I say I heard of it; but Governor Magoon was there on the ground, and I would suggest that he could tell about that.

The CHAIRMAN. Governor Magoon did explain that in his testimony.

Senator TALIAFERRO. Did he?

The CHAIRMAN. Yes; that is in his testimony.

Senator TALIAFERRO. That escaped me.

Senator ANKENY. In your evidence, Mr. Shonts, you spoke of the rating given by those boards—those insurance people—upon those ships you bought.

Mr. SHONTS. Yes.

Senator ANKENY. Could you furnish that in connection with the other matter—what rating they gave you? You said they gave you a rating. An insurance rating is a wide thing, you know.

Mr. SHONTS. I do not have that in my mind, Senator, but I will get it all for you.

Senator ANKENY. Could you embody that in the report that you promised to make?

Mr. SHONTS. Yes, sir. Now, let me see if I understand just what you want: You want not only what we have already promised to send in—their report as to the condition of the ships—but you want the rating that they gave us for insurance?

Senator ANKENY. Yes; just as if we were going to put a ship to sea—such a rating as the insurance people would give us, or the appraisers, as you call them.

Senator TALIAFERRO. And the amounts for which the ships were insured.

Mr. SHONTS. When the Ward Line had them?

Senator ANKENY. When you bought them.

Mr. SHONTS. Yes; when we bought them.

Senator ANKENY. And the rating they gave you.

Mr. SHONTS. Yes, sir.

Senator ANKENY. You spoke of one ship, an English ship. You have said nothing of the other ship. Was the rating the same?

Mr. SHONTS. The English ship was a new ship. It was not finished when the negotiation was under way.

Senator ANKENY. You have since put her to sea, have you?

Mr. SHONTS. Oh, no; we did not buy the English ship, and we do not know anything about that.

Senator ANKENY. Oh, you did not! Kindly embody in that other report, then, a copy of the rating those insurance people, or appraisers, whatever you call them, gave you.

Mr. SHONTS. Yes; I will.

Gentlemen, can I say one thing to you before I go away?

The CHAIRMAN. Yes; certainly.

Mr. SHONTS. I want to tell you—I have no doubt you realize it, but possibly you do not realize it just to the extent that you might—that we are becoming handicapped by reason of uncertainty as to the type of canal, and legislation. Mr. Stevens to-day has quite a large force of civil engineers. If a certain type of canal is decided on, he has an excess of some kinds of engineers and not enough of others. If the other type is decided on, the thing is reversed. We have men who have accepted positions provided a certain type of canal is to be constructed—one man particularly, that we may lose, and we are very anxious, if a lock canal is adopted, to secure his services, because we think he is the best expert on locks in the world.

We have a big force at work, and we have our preliminary work pretty well along. Of course we are setting up our machinery and doing all we can, but we are uncertain as to continuing certain lines of work, for fear that if a certain type of canal is decided on that work will be worthless; and we do not want to be criticised. We can not “abandon the fort;” we can not stop working; and we do not want to make any mistakes.

I simply want to urge on you before leaving that if you can do anything to hasten the decision regarding the type of the canal, I think it is the most pressing practical question before us as a Commission.

The CHAIRMAN. I will say, Mr. Shonts, that we have sidetracked everything else now, and we are going to have engineers come to see us; and we will probably be through in a short time as to the type of the canal, as far as this committee is concerned.

Mr. SHONTS. There is another thing that I might say, but with a great deal of hesitancy, because I do not want you to think that I undertake to presume. This engineering question is a highly technical question, however; and I know you gentlemen are all sincere, and want to get the best views in the best way possible. I would suggest that you have Colonel Ernst to sit with you, because he is fair, he is able, he has studied this question for years locally, and I think that he could be of great use to you in helping you to get the information that you want to get from the experts that you call. I only mention that as a suggestion that might help you get what you want to get.

Then one other thing. I do not know, of course, what your views are, and I do not wish to say anything one way or the other, except that Senator Morgan’s inquiry of me as to the feasibility of a dam at Gatun suggested this thing to me forcibly: If you are going to go into that question, I would ask that you get before you the men who have built the biggest dams, the best practical experts in that particular field of work. I would recommend Mr. Stearns, who was in the consulting board, and who, I am told, stands as high in the profession as any man in the world on the question of dams.

If the question of hydraulics comes up, I would recommend that you get Mr. Knowlton, who is probably as eminent as any man living in hydraulics.

In other words, hearing you say that Mr. William Barclay Parsons was coming, and Mr. Bates, and that Mr. Wallace was to return has induced me to say that it is an important question, and it is far-reaching; and I would like to have you, before you make up your minds, get the men on the other side that stand the highest in the profession in their specialties.

Senator KITTREDGE. There is one suggestion, Mr. Shonts, that I think I ought to make in behalf of the committee, concerning the necessity for speedy action regarding the type of the canal. That is the fact that the reports of the consulting engineers and the report of the Canal Commission were not made public until about two weeks ago, and that since that time the engineers have, through our chairman, been asked to prepare for this examination that we begin to-morrow.

I simply state that in justice to the committee, so that you may understand that it is no fault of the committee that the work has not been done earlier.

Mr. SHONTS. Yes; but, you understand, I was not speaking of it in that way. I do not want you to think I am presuming at all; but I want to impress on you our real condition, our practical conditions on the Isthmus—what we are “up against” down there—and we shall be glad if you will do all you can to give us as early a decision as possible.

I am very much obliged to you.

(The committee thereupon adjourned until to-morrow, Wednesday, March 7, 1906, at 2 o'clock p. m.)

(The following are the papers referred to in the foregoing proceedings:)

STATEMENT OF THEODORE P. SHONTS, CHAIRMAN ISTHMIAN CANAL COMMISSION, REGARDING TESTIMONY OF MR. R. P. SCHWERIN, VICE-PRESIDENT AND GENERAL MANAGER OF THE PACIFIC MAIL STEAMSHIP COMPANY.

For your consideration, in connection with the testimony of Mr. R. P. Schwerin, vice-president and general manager of the Pacific Mail Steamship Company, I think it is best to give you—

First. A statement as to the general policy of the Panama Railroad Company.

Second. A statement as to the causes of the congestion referred to by Mr. Schwerin.

Third. A statement as to what was necessary to provide a remedy and remove the cause of the congestion.

GENERAL POLICY.

The general policy of the railroad is to handle all traffic offered promptly, whether it consists of canal supplies or commercial freight, without prejudice. There was a time during the interregnum between Mr. Wallace's departure and Mr. Stevens's arrival when the health conditions on the Isthmus were so bad that a panic among employees was imminent, causing Governor Magoon to issue an order discriminating in favor of canal supplies, in order to get lumber to construct quarters in sanitary neighborhoods. That order was short lived, however, and to-day, as shown by letter of Superintendent Blerd to Traffic Manager Walker, dated December 26, 1905, page 5, of which I will

give you copy, the rule is that the superintendent "diverts cars or takes cars from other trade to concentrate them on the cargo necessary to let the ship go on time."

CAUSE OF CONGESTION.

It is usual for railroads to deliver tonnage to steamship lines in the order of port calls, as asked for. This rule has been enforced for years on the Isthmus and is the rule under which we are now working. I have been advised by Mr. Stevens since his return to the Isthmus that freight is and has been at all times given the Pacific Mail Steamship Company exactly as called for by written order of their agent at Panama.

The chief cause of congestion, aside from lack of terminal facilities, equipment, and power, with which the Panama Railroad has had to contend for some time, has been the failure of the Pacific Mail Steamship Company to furnish sufficient ships to take the tonnage from La Boca which had accumulated on the Isthmus for that company.

The Pacific Mail has intensified this condition at times by refusing to accept tonnage we have had ready for them and waiting on the Panama side, and which has filled the most of our available equipment; in insisting that we bring over instead tonnage from Colon, sometimes going to the extent of asking for tonnage which had not as yet been unloaded from the ships at Colon. The Pacific Mail has also aggravated the situation by giving orders as to the tonnage they wanted, and, after we had arranged to deliver it to them as requested, changing their orders, even occasionally after we had begun to load it on the first orders; and Mr. Stevens reported to me personally, while here, a request from them to take back several hundred tons onto the wharf, which they had received and loaded into their ships on their orders. This he refused to do.

The superintendent's same letter shows that Mr. Bierd, instead of being a "stone man," is working night and day to keep the movement of traffic across the Isthmus in a normal condition, and so far as south-bound lines are concerned there is no complaint whatever, as shown in letter from Superintendent Bierd to Traffic Manager Walker, dated January 10, 1906, page 2, in which he says: "There is no accumulation of freight for the south-bound lines, and not one complaint has reached us from either of the agents of these lines." This statement is verified in a letter from Ricardo Arias, dated Panama, November 6, 1905, to the Secretary of War, in which he reports that the agents of both south-bound lines say that they have no complaints to make, and that no discrimination is made by the Panama Railroad between the steamship lines.

It will be observed from Mr. Bierd's letter that the chief obstacle in the way of our carrying out the policy of delivering freight as called for by the steamship lines is the lack of sufficient equipment, but inasmuch as new equipment is now being shipped, and is expected to arrive within sixty days, he feels that the situation will be materially improved, as shown on page 6 of the letter of December 26, referred to above. I will give you a statement showing new locomotive and car equipment ordered for the Panama Railroad Company and Isthmian Canal Commission, which will also show when such equipment was ordered, the quantity already delivered, and when the remainder will be delivered.

Formerly the Pacific Mail Steamship Company, in addition to its regular sailings, had an auxiliary service to Central American ports. Although this service was discontinued at our request, in order to take care of the larger traffic handled by the regular sailings, this latter traffic has grown to such an extent that an auxiliary service to Central American ports now becomes necessary in addition to the regular sailings.

If all of our connecting steamship lines were as unreasonable in their demands as the Pacific Mail Steamship Company is in reference to the manner in which tonnage should be delivered them, the amount of track and equipment which would be required by the Panama Railroad to take all the business from connecting lines at both ends of the railroad, store the same until called for, and then deliver it in the order of port call, without previous notice to the railroad and without any effort at cooperation, would be unreasonable from either the standpoint of the volume of business offered or the size of the road.

REMEDY.

As a remedy for the unsatisfactory relations which have existed between the Panama Railroad Company and the Pacific Mail Company for a number of

years, as you will see from copies of letters which I will give you written July 19 and July 26, 1899, by Mr. J. R. Shaler, then superintendent of the Panama Railroad, to Mr. Charles Paine, then general manager, the following action was needed:

First. On the part of the Panama Railroad Company: New, improved, and enlarged terminal facilities in the way of wharves, terminal yards, and heavier (larger capacity) locomotive and car equipment, which we have arranged to provide.

Second. On the part of the Pacific Mail Company: More and larger ships and more regularity in their arrivals, as well as more of a disposition to co-operate with us, without which cooperative disposition the results will not be satisfactory regardless of all we and they may provide in the way of additional facilities.

Third. On the part of both the Pacific Mail Company and the Panama Railroad Company: A better system of advices each to the other as to the amount, character, and destination of freight to be delivered one to the other, and more advance information as to the time of arrival of the steamers of both companies.

Referring to that part of Mr. Schwerin's testimony with regard to the reduction of rates from United States points to Mexico to the same level as rates from Europe to Mexico: Inasmuch as the same terminal charge at La Boca applies to European freight as does to freight from the United States, and inasmuch as the Pacific Mail Steamship Company received a proportion of the through rates 5 per cent greater on business from the United States than it does from Europe, without any increase in cost, if it became necessary for the Pacific Mail to differentiate as between European and United States shipments, that company is in a position to favor rates from the United States because it receives more money for the same service, with the same expense of operation, on United States business than it does on European business.

In connection with Mr. Schwerin's statement as to their steamers being delayed waiting for coal, I am advised by Mr. Stevens since his return to the Isthmus that not a ship has been delayed for coal during the past year except the *Newport*, which on one occasion, owing to a temporary shortage in our coal supply, had to take coal from the Pacific Steam Navigation Company. The coal we have been furnishing them is Pocahontas coal, purchased from Messrs. Castner, Curran & Bullitt, and not from Berwynd Brothers, as stated by Mr. Schwerin.

In Mr. Schwerin's testimony he states: "The increase of 1905 over 1904 of freight from the United States and Europe to the Isthmus of Panama, that stayed there, you understand, that was not billed beyond there to the south or to the north and might have been for canal purposes or for use locally or anything else—I do not know what the ultimate destination of that freight was, but it remained on the Isthmus for local consumption," only increased from 17,262 tons in 1904 to 29,046 in 1905.

I do not know where Mr. Schwerin obtained such figures, but I will give you a letter from Mr. R. L. Walker, traffic manager, Panama Railroad Company, dated February 4, 1906, showing the total tonnage moved by the Panama Railroad annually from all points to all points from 1895 to 1904, inclusive, and a comparison of the ten months, January to October, inclusive, 1905, with the same months 1904, also a statement showing the tonnage handled by the Panama Railroad Steamship Line from New York only for Colon and Panama, being the local tonnage referred to by Mr. Schwerin. You will note that during the calendar year 1905 the Panama Railroad Steamship Line handled, from New York only, 65,295 tons as against 23,854 tons in 1904. This you will note does not include any tonnage from Europe in either year nor does it include tonnage brought to Colon by steamers other than those of the Panama Railroad Steamship Line in either year.

As you probably know, in addition to the steamship lines from Europe there are two other steamship lines with regular sailings from New York to Colon and one from New Orleans to Colon, in addition to which, during the year 1905, a great many tramp steamers and schooners were constantly bringing to our docks at Colon and Cristobal heavy shipments of materials for the Canal Commission, so much so that we had great difficulty during the entire year 1905 in furnishing sufficient dock room, while during the year 1904 there was comparatively little material received for the Canal Commission. The Panama Railroad has no statistics of tonnage taken to Colon by steamers other than by its own line from New York for local consumption on the Isthmus, but it is safe to say that during the year 1905 (on account of the fact that until

1905 there was very little material brought there for the Canal Commission) there was delivered on the Isthmus for local consumption on the Isthmus at least five times as large tonnage as during the year 1904.

In connection with the statement made by Mr. Schwerin that during 1905, in addition to regular lay days, their steamers were delayed one hundred and thirty-seven days at La Boca, Mr. Stevens reports that their steamers have been enabled to get out within their regular lay days in every case except where they have bunched their ships regardless of schedule, and we have, at their request, worked irregular ships around scheduled ships. They have bunched as many as five ships at La Boca at one time. I will give you a letter from Mr. Stevens, dated February 8, 1906, a few days after his return to the Isthmus, showing in detail the delays which actually occurred and the causes.

In closing I desire to call your attention to the statements made in Mr. Shaler's letters of July 19 and 26, 1899, to which I have just referred. You will note Mr. Shaler says, in his letter of July 19, 1899:

"We have a great deal of trouble with the Pacific Mail from time to time by their ordering certain shipments to be made by a certain vessel and then changing their orders." And in his letter of July 26, 1899:

"It not infrequently happens (on the contrary frequently) that they order cargo for their ships and then change that order afterwards, requiring from us quite a good deal of extra switching. We ordinarily don't complain about this, and we do not care to do so now, but I merely mention it to show that if we were disposed to make complaint, there are but few days in the year when we should not be entirely justified in so doing."

This hardly agrees with Mr. Schwerin's statement that "along about the summer of 1904, while we were still operating with the Panama Railroad Company under our contract, things began to change from a regular, orderly system of handling freight from the Atlantic to the Pacific and from the Pacific to the Atlantic." The Panama Railroad Company was then apparently having the same difficulties it experiences now in doing business with the Pacific Mail Company.

In addition to copies of the letters and statements I have referred to, I will furnish you copies of the following papers, which throw some light on the subject under discussion:

Letter from W. G. Bierd, superintendent, to R. L. Walker, traffic manager, Panama Railroad, dated December 6, 1905.

Letter from W. G. Bierd, superintendent, to R. L. Walker, traffic manager, Panama Railroad, dated January 4, 1906.

Letter from W. G. Bierd, superintendent, to R. L. Walker, traffic manager, Panama Railroad, dated January 15, 1906.

Letter from T. P. Shonts, chairman Isthmian Canal Commission, to the Secretary of War, dated January 10, 1906.

Letter from R. L. Walker, traffic manager Panama Railroad, to R. P. Schwerin, vice-president and general manager Pacific Mail Steamship Company, dated January 23, 1906.

Letter from R. L. Walker, traffic manager, to T. P. Shonts, president Panama Railroad Company, dated February 9, 1906, together with copy of the inclosures referred to therein.

Statement showing the mail earnings of the Panama Railroad Company for the year 1904 and eleven months of 1905.

Telegram from T. P. Shonts to John F. Stevens, February 2, 1906, and reply to same of February 7, showing conditions in reference to freight congestion at La Boca.

Cablegram from John F. Stevens to T. P. Shonts, dated February 15, 1906, stating that with the heaviest coffee movement for ten years there is not to-day one ton of delayed freight on the Isthmus.

T. P. SHONTS.

WASHINGTON, D. C., February 19, 1906.

Letters Nos. 7925, of July 19, 1899, and 7963, of July 26, 1899, are sent as indicative of a situation shortly after the breaking of a strike, long before the United States Government had any idea of obtaining control of the property, indicating the difficulties experienced by the Panama Railroad Company in its dealings with the Pacific Mail on the Isthmus.

COLON, July 19, 1899.

CHARLES PAINE, Esq.,

General Manager Panama Railroad Company, New York.

DEAR SIR: Your No. 6725, file 598. In accordance with your instructions I inclose copies of letters of Captain Beers in answer to those of Mr. Lefevre. I direct your attention to Captain Beers's answer to Mr. Lefevre's letter of March 15 (at least I suppose that to be the date, although it is nearly obliterated), and I have underlined a portion of it that gives the precise conditions. Of course during the strike conditions, which, so far as the Pacific Mail was concerned, only terminated on the 2d of April, all delays and all irregularities prior to that were immediately consequent upon the strike, and for a considerable time after that we were troubled in the same way by having a very large amount of freight upon the Isthmus that had accumulated principally for Atlantic lines.

The Pacific Mail has always, at least during my administration and for some years before, been in the habit of directing precisely what cargo they wish forwarded by the different ships, and as far as possible we have always complied with such directions. During the time that the freight was piled up in the different warehouses it was simply impossible to make the shipments as required by the Pacific Mail, for the reason that although we had a very considerable portion of such cargoes ready to deliver, we could not do so, because the lots were incomplete. Many of these were comparatively small shipments, and we suffered very much inconvenience from not being able to deliver the goods as they came; but you will readily understand that with promiscuous cargo piled up in enormous masses it was simply impossible to get each lot out separately; yet the Pacific Mail never had any ship leave here without cargo except when they absolutely refused to receive cargo from us.

It would be unjust to say that we always were able in every case to comply with what was convenient for the Pacific Mail. You will observe that they require their cargo to be loaded in a specific manner, so as to enable them to load with reference to the convenience in discharging at the different ports, and this requires a great deal of labor on our part, but I think it is something that ought properly to be done; nevertheless the effect of it is at times to make it impossible, particularly during such times as we had during the strike, to deliver just as they wish their cargo. We have a great deal of trouble with the Pacific Mail from time to time by their ordering certain shipments to be made by a certain vessel and then changing the orders. We have not been so much troubled with this this year as formerly, but it is always more or less a cause of great inconvenience to us.

If there is any information that you desire specifically, I shall be glad to get it up in as good shape and as promptly as possible.

Yours, very truly,

J. R. SHALER,
Superintendent.

It may be said that sometimes we do ship lots incomplete. That is true, but only in such cases as are unavoidable.

J. R. S.

OFFICE OF SUPERINTENDENT PANAMA RAILROAD COMPANY,
Aspinwall (Colon), July 26, 1899.

CHARLES PAINE, Esq.,

General Manager Panama Railroad Company, New York.

• DEAR SIR: I beg to report to you that the steamer *San Jose* sailed on the 19th instant for San Francisco and way ports, leaving behind about 656 tons of the *Allanca* cargo for San Francisco, of which 508 tons were oil and iron and 40 tons nails. She left launches Nos. 6 and 13 full of cargo and about 40 tons in launch No. 16, all of which had been ordered forward by the Pacific Mail, but which they were unable to take. This ties up for us three launches until the 3d or 4th of August, which will be the next ship which will take this cargo.

I don't see a just reason to complain about this, because the Pacific Mail can not always tell with certainty just what cargo they can take, and I don't mention for the purpose of having any question brought up with them. It not infrequently happens (on the contrary, frequently) that they order cargo for their ships and then change that order afterwards, requiring from us quite a deal

of extra switching. We ordinarily don't complain about this and do not care to do so now, but I merely mention it to show that if we were disposed to make complaint, there are but few days in the year when we should not be entirely justified in so doing.

Yours, very truly,

J. R. SHALEB, *Superintendent.*

PANAMA, November 6, 1905.

HON. WILLIAM H. TAFT,

Secretary of War of the United States, Cristobal, C. Z.

DEAR SIR: As requested by you, I called to-day on Mr. Charles Peebles, agent of the Pacific Steam Navigation Company, and on Mr. John Ehrman, of Messrs. Ehrman & Co., agents of the South American Steamship Company, and inquired of them whether they had any complaint to make as to the treatment that they are receiving from the Panama Railroad Company, specially as to discriminations between their companies and the other steamship company (the Pacific Mail) carrying the northern west coast trade.

Both gentlemen stated that they had no complaint to make and that no discrimination is made by the Panama Railroad Company between the three steamship lines.

Wishing you a safe and happy return to Washington,
I have the honor to be, yours, respectfully,

RICARDO ARIAS.

NOVEMBER 25, 1905.

MY DEAR SIR: I beg to acknowledge the receipt of your letter of the 6th of November, giving me the result of your inquiry of Mr. Charles Peebles, agent of the Pacific Steam Navigation Company, and of Mr. John Ehrman, of Messrs. Ehrman & Co., agents of the South American Steamship Company, as to whether they had any complaint to make as to the treatment they were receiving from the Panama Railroad Company, especially as to discriminations between their companies and the Pacific Mail Steamship Company, and to thank you for the same.

Very sincerely, yours,

WILLIAM H. TAFT.

RICARDO ARIAS, Esq., *Panama, Panama.*

OFFICE OF GENERAL SUPERINTENDENT.

PANAMA RAILROAD COMPANY.

Colon, December 6, 1905.

Mr. R. L. WALKER,

Traffic Manager Panama Railroad Company, New York.

DEAR SIR: Answering yours of November 15 on the subject of complaint from the Pacific Mail Company: All of the facts set forth in your letter are more or less true. Cars generally known as "mixtures" have existed for a long time, and they still exist, and there has been a few errors in billing a car, being billed as San Francisco when in reality it contained Central and Mexican cargo.

These are mistakes common to this and all other railroad services, but for more than thirty days I have had up the subject of mixed freights in the same car, or more properly speaking, two or three destinations in the same car, and I have a report from each agent whenever the forwarding agent sends to him such mixed cars, and each and every case is investigated, and we hope to have this reduced to a minimum, and in fact I believe it is so reduced now, but it is to our interest, with the limited equipment that we now have to place more than one destination in each car. We can not afford to let a car pass over the road half full when we can fill it by putting in other destinations, but there is no harm to come from this, so long as the car slips show properly what is in the car.

As to Mr. Pearne writing his vice-president, I only have to say that Mr. Pearne has so completely worn me out by sending six or seven page telegrams

and following them up by sending three to five page letters telling us how to run the railroad, that I have practically ceased to answer two-thirds of his foolish questions. Mr. Pearne has gone so far as to direct me how to load freight and handle our ships at Colon. A few days ago he wrote me, saying that he was in hopes, now that dock No. 4 was clear, that we would load direct from the ship onto the cars, but stated that he found, while on the wharf to-day (meaning the day he wrote the letter), that we were still putting cargo on the dock floor and afterwards picking it up and loading into cars. If Mr. Pearne does not know by this time that this is practically an impossibility on any steamship and railroad line, saying nothing about our conditions here, where it takes all of the knowledge of our forces to try and make our box cars go around, serving our ships in their proper order, and where cars are worth their weight in gold, it seems that his criticisms are not worth noticing.

I shall try and answer Mr. Pearne on every subject and give him information on every business point that he asks, but I certainly can not answer such telegrams and letters as he has been writing. It does not occur to me that Mr. Pearne is interested in whether we send cars to La Boca with one destination or four so long as he receives his cargo in time and in proper condition to go aboard of his ships.

Yours, truly,

W. G. BIERD, *Superintendent.*

OFFICE OF GENERAL SUPERINTENDENT
PANAMA RAILROAD COMPANY.

Colon, December 26, 1905.

Mr. R. L. WALKER.

Traffic Manager Panama Railroad Company, New York.

DEAR MR. WALKER: I have yours of November 24 and have delayed in answering only for the reason that I have not found time to do so sooner. I try to keep up with my correspondence with each current day for such as need immediate attention, but your letter, being partly of a personal nature and partly on business matters not requiring immediate attention, I have deferred to reply until now.

First, with regard to the situation here and myself, I beg to thank you most kindly for the interest you express in my welfare, and hope that I will be able to fill the requirements of your greatest expectations: at least I shall try to. While I feel pleased with some of the work that we have been able to accomplish and feel fairly satisfied with what has been done and hope that others feel the same, I most fully realize that there is still a great deal remaining undone, and that still further time and energy will be required to accomplish all that is desired; but I feel that we can meet these requirements if good health continues and unforeseen obstacles do not arise. I shall try not to overdo myself, and use the best judgment possible as to how long and how hard I can work, for I realize that a sick man or a dead man is of no service.

As to an assistant, or some one to perform the work described in your letter, viz, seeing to the movement of cargoes from one side of the Isthmus to the other to make proper connections, advise connecting lines, and so forth, I have weighed and studied this situation carefully as presented by you, and there is no doubt about the value of some man to perform this service, and we have been working to this end, and I believe that we now have got shaped up to the point that Mr. Bergin, the present train master, can practically leave his inside office duties and spend the necessary amount of time, if not the greater part of his time, in outdoor service, and with other duties cover the service that you refer to: but no matter how many men we have or what their duties may be I find other obstacles:

First, as to notifying the connecting lines as to just when we can complete cargoes to them so that they may intelligently fix the sailing of their vessels, arrange their cargo, and so forth. On this subject I have to say that they frequently ask when we will complete cargoes for two, three, or four vessels on the Atlantic side, three, five, or six days in advance of the sailing of their vessels. We give them the most intelligent information that can be given that far in advance, but we are not able to give them a definite reply and thereby commit ourselves. They frequently ask, if they will hold their vessel to a given time, can we complete certain cargoes? If we answer them yes, and they hold their vessels and we then fail, the responsibility is with us and they find fault, and

quite justly so. Again, if we do not give them the definite information, and they allow their vessel to go on time or at a fixed date, and the cargo is completed twelve or twenty-four hours later we are again practically responsible for the cargo being left; so in reality the responsibility rests with us in either case.

Now, you will ask—and most any intelligent person will ask the same—why we do not give them a definite reply, and if a man was employed for the service that you describe he would be able to give them such replies, but I beg to advise that this is hardly true, and it is not for the want of advice or knowledge that we fail to give them the desired information, but it is because no man can tell that far in advance, even though he devoted his entire time to the subject, whether the cars can be had to complete the cargoes at a given time. We answer them as near as possible what can be done, protecting ourselves by saying if all conditions prove favorable that we can deliver them cargo at a given time, but it is impossible to say on Tuesday, or even on Wednesday, that we can complete given cargoes on Saturday; our equipment is so limited, and has to be used so economically and moved so promptly that if the slightest disturbance or delay arises all of our plans miscarry, and we are unable to complete the certain cargoes on certain dates.

We can see plainly that three or five cargoes on the Atlantic side can be moved or handled for movement to the Pacific side, so far as our ability to handle it is concerned, and so far as our ability to discharge it from the ships is concerned, if we can unload the cars prompt enough on the Pacific side to get them to Colon in sufficient quantities to handle the business; but when our plans look the best, and it appears that we will be able to unload in La Boca and Panama sixty or seventy cars a day, and that these cars can be returned to Colon half loaded and half emptied, the empties to be again loaded, and the loaded cars to be emptied and stored in our docks or in the freight house at Colon and thereby meet the demands exactly, the ships on the Pacific side will arrive late, they will dock a day late, they will not be able to discharge prompt enough to begin to take in and thereby empty our cars on time, and without sufficient warning that anyone can foresee we are immediately thrown back from one to two days. This makes the empty movement to Colon two days late, and, in turn, the delivery of cargo to the Pacific side accordingly late, and our information is entirely false.

There is still another element, that if the La Boca side carries out to the letter and gets a number of cars to us loaded, and that it would seem that we could be prepared to handle them promptly at Colon and use them back to make the proper connections, our house will be full, and our limited dock space will be occupied, and one or two foreign ships will fail to receive within one or two days of the time that they should receive, either by arriving late or being slow in discharging, and we find that we have to hold the cars under load until the proper space can be had to unload them, and again we find ourselves short of cars to enable us to promptly and definitely deliver cargo to the Pacific side.

I believe there is not twenty-four hours that passes that I do not go over the freight-car situation thoroughly, and, in fact, I practically know every twenty-four hours where every car on the Isthmus is, when it will be unloaded, when it can move, and when it will be reloaded, if all things work out right; but the conditions above mentioned enter into the situation so often, and we are so short of equipment, that definite information three or four days in advance is absolutely impossible.

Second, as to advice passed from one side to the other, I believe that we now have this as well worked out as we can have to enable use to give the foreign ship lines as much information as can be given; we make up a daily report, each agent notifying the other at 10 a. m. the amount of cargo on hand, what will be received for that date and for what lines, and when cargoes will be completed, or, more properly speaking, what we expect to complete; but the above-named elements enter in and we sometimes fail; but this condition has improved very much and is still improving until I believe there are no just grounds for complaint; a copy of each agent's report comes to me, and at the close of each cargo, if I see that the cargoes are not being completed on time for the C. S. A. de V., or the P. S. N., or the Pacific Mail, I immediately take hold of the situation myself, and divert cars, or take cars from other trade and concentrate them on the cargo necessary to let the ship go on time, or by advising the connecting line that if they will hold their ship

one day or to a given hour, that we will complete their cargoes; it is true that this takes lots of time, hard work, and long hours, but it is the only way that it can be handled until we have more equipment at our disposal, and as we should receive relief in this line in the next sixty days I feel that we have nothing particularly to fear.

As to the Wine X the *Aztec*: As you know, the *Aztec* came to us as an extra ship, by our request, to clean up an accumulation of freight then on the Isthmus. The *Aztec* arrived in advance of the *Peking*, and ordinarily it would appear, and quite naturally so, that she arrived in time for her cargo to connect with our ship on this side, whereas it in reality did not, but laid over for the *Advance* October 28, or being sixteen days from the time of arrival until departure. But the real facts in the case are these: While the *Aztec* arrived in time, and her cargo should have made the immediate connection if handled in its turn, we did commence to receive from the *Aztec* first, and got one day's discharge from that ship when the *Peking* arrived, being a ship of the same line, but as the *Peking* was a regular-line ship, and it was necessary for her to go on time to make her regular ports of call, the agent of the Pacific Mail Company asked that we give attention to the *Peking* first, thereby practically allowing the *Aztec* to fall back and be served when she could be; hence the *Peking* was worked around or ahead of the *Aztec* not only to allow the *Peking* to go on time as a regular-line ship, but also because of the holidays that were approaching, and as there were three of these days and one Sunday it appeared that we would practically have no dock forces to accomplish any amount of work for about four days, and Mr. Pearne wrote and wired so very strongly as to being reasonably sure that the *Peking* should be handled and got away before caught by the holidays, therefore the *Aztec's* cargo was largely neglected in favor of the *Peking's*. But we did better than either he (Mr. Pearne) or ourselves expected, and in the end got both ships away before the holidays, or the last one, being the *Aztec*, completing on the last day. But the Wine X the *Aztec* for the above-named reasons missed her first connection on this side and went forward by our next boat, partly for the reason that both ships could not be discharged in time, and for the further reason that we did not have enough equipment to serve and handle both cargoes more promptly.

Hoping that the above will be a satisfactory explanation, and give you a little better detailed idea of our difficulties, I remain,

Yours, most respectfully,

W. G. BIEBD, *Superintendent.*

PANAMA RAILROAD COMPANY,
OFFICE OF GENERAL SUPERINTENDENT,
Colon, January 4, 1906.

Mr. R. L. WALKER,

Traffic Manager Panama Railroad Company, New York.

DEAR SIR: Referring to yours and confirming my cablegram of to-day, and also your cablegram of December 26 and my reply of January 3 on the two subjects:

First. The claim of the Pacific Mail that we still delay cargo and disarrange their sailings, on this subject I have to advise you that I have checked up several sailings and find the following:

Their steamer due to sail on the 28th [November] sailed on the 30th, two days late. This steamer arrived one day late, and during her call had one national holiday, therefore we were responsible for no delay. Their steamer due November 26 arrived five days late and departed five days late, therefore lost no time here.

Their steamer due on the 3d arrived on the 5th, two days late, due to sail on the 12th, and sailed on the 16th, being two days late arriving and four days late leaving, but in reality arrived three days late, as it was too late on arriving day to accomplish anything, therefore lost one day here.

Their steamer due to arrive on the 10th arrived on the 12th, due to sail on the 19th, sailed on the 22d, losing one day here, but practically, like the above, was really three days late arriving, as she arrived late on the 12th.

Their steamer due to arrive on the 17th and due to sail on the 26th, this sailing was suppressed, as they furnished us no steamer for that week, having applied the ship in other trade. The failure on their part to have this ship call here was the beginning of our blockade.

Their steamer due to arrive December 24 arrived December 28, being four days late. This steamer is now in port and due to sail January 2. Will sail January 5, arriving four days late and leaving three days late, hence we make them one day late on this sailing. Their steamer due December 31 did not arrive until the afternoon of January 3, being three days late.

Under these conditions I fail to see but what their steamers are receiving good service here. However, when this matter was taken up with their agent the only reason that he could give for the statement was that some two or three years ago the steamers arrived, discharged, and received their cargo and left in shorter time than they are doing now, and he gave his own reasons for this delay by stating that we were unable to handle cargo now as fast as we had been in the past, for the reason that the hours worked and the salaries paid by the Isthmian Canal Commission had spoiled the labor here. Therefore our dock labor was not as proficient as it had been in the past, but I think that this is not a true reason, although there may be something in the statement, but the real reason is two things: First, that they have changed their method of handling their cargo, and load their ships differently to what they did at that time, trying to classify their cargo too closely to suit certain ports of call, and further, that they do not now operate a local ship at stated times to make several local ports, and for the second and further reason that owing to our large increase of business on the Isthmus we are not able to furnish the cars and classify their cargo as well as it was once classified when the business was light and the equipment could care for all.

At the present time, or when I wired you, we had at Colon for the Pacific Mail 3,871 tons, and at La Boca for the Pacific Mail 5,000 tons, making 8,871 tons of cargo on the Isthmus for them, of which you will note 5,000 tons was at that time in La Boca. When their steamer sailed December 16 they shut out 780 tons of cargo; when their steamer sailed January 22 they left or shut out 1,900 tons of cargo. This was due to the fact that they gave us two small steamers that took light cargoes, and further due to the fact that their sailing of December 26 was suppressed and they furnished no steamer at all, and by the time the *Peking*, now in port, sails they will leave something over 6,000 tons of cargo on the Isthmus.

As to their claim made in your cablegram of to-day, that they do not understand why there is an accumulation here when their steamers are leaving without full tonnage, I have to advise you that this is a matter wholly in their own hands, and it is due to the fact that they have their steamers leave here to suit their time and local ports of call, regardless of the amount of tonnage to be moved, whereas if they would take such tonnage as there is for them and stop at the ports that it is destined to, there would be sufficient tonnage for every ship that sails.

There is another and further feature to this, that it makes the handling to us very expensive, they should take the cargo in its regular turn and not try to pick out just such cargo as suits certain ports of call. For example, with this surplus of cargo now in La Boca and in Colon, that has been here for a long period of time, they are wiring us to give them cargo that is not yet out of the ship on the Atlantic side, while 3,000 tons of cargo for them are in cars at La Boca and Panama, tying up our equipment.

Yours, truly,

W. G. BIERD, *Superintendent.*

PANAMA RAILROAD COMPANY,
Colon, January 10, 1906.

Mr. R. L. WALKER,

Traffic Manager, Panama Railroad Company, New York City.

DEAR SIR: Referring to yours of December 29, which refers to several cablegrams, and a copy of your letter to Mr. Schwerin.

While I presume you have before now received my letter giving the situation here in detail, I regret very much to have to make cablegrams and yet I find that little detailed information can be given in cablegrams that is to any extent satisfactory, but I can only say that I am surprised at the attitude and position taken by the Pacific Mail people. They have certainly treated us badly, and notwithstanding what any person says to the contrary, the only congestion or delay to cargo that exists on the Isthmus is due to the inability or indisposition of the Pacific Mail to move their cargo promptly.

Thirty days ago we had reached a condition here that I am certain in saying was entirely satisfactory. We had cleaned up all old cargo, our docks were in good condition, and were passing freight in both directions from one side to the other in current order. Ships arriving at Colon with any reasonable time to get their cargo out was passed across the Isthmus for the departure of the line ship on that side, and the same on northbound business coming from La Boca, or, without going into details by cargoes, our freights were passing the Isthmus on an average of ten days, and if the ships were in port to receive it, many times in three, five, and six days.

I can give no better evidence of this fact than to cite you that there is no accumulation for either of the south lines, and not one complaint is reaching us from either of the agents of these lines, but the Pacific Mail has not given us a ship to take even a decent cargo for the past thirty days, except the *City of Peking*, which sailed on the 7th; and in addition to this they have cut out one sailing entirely, and with the two small ships that were furnished the accumulation commenced, leaving over 1,000 tons; the next sailing left 2,000 tons; the cutting out of one ship entirely, with the heavy run on this side, immediately ran it up to 5,000 tons; and after the *City of Peking* left they still had here 3,000 tons, which will fall back practically to 5,000 before their ship now in port gets away with her cargo. We had our equipment unloaded and could handle it to move cargo, whereas now not only are our wharves congested with Pacific Mail cargo, but 175 cars are at this moment under load and tied up awaiting them to take the freight.

Their ships are arriving to us from one to four days late; in fact, their ships arriving late until one sailing had fallen back onto the date of the following sailing. They load their ships for ports to suit their own convenience, and many times to serious loss and damage to us, making our expense of handling unusually high, and while I do not know their intention in doing this, I believe they maneuver with their ships for the purpose of getting them back to meet the south-bound or coffee trade instead of trying to clean us up and move the north-bound business.

As to their ships leaving here late, all cargo is delivered to them just as their agent asks for it, and we can not of course give them cargo that they will not take, or for ports that their ships do not call at, whether they have full cargo or not, and I wish to again repeat that the only delayed cargo now on the Isthmus is due to inability of the Pacific Mail Company to move it, and not to the inability of the Panama Railroad Company to deliver it. This not only delays their cargo but ties up our equipment and congests our wharves and consequently south lines suffer also.

I think my last letter gave you practically all the necessary details, dates, and so forth, and all that is necessary at this time is the general statement which I can substantiate in every respect. We cleaned up and were in first-class operating shape, and to prove my statement herein, if the Pacific Mail will furnish the ships to move the cargo we will demonstrate again our ability to deliver it, and again clean up the congestion, notwithstanding our immense increase in business.

Yours, truly,

W. G. BIERD, *Superintendent.*

PANAMA RAILROAD COMPANY.
Colon, January 15, 1906.

Mr. R. L. WALKER,

Traffic Manager Panama Railroad Company, New York.

DEAR SIR: Referring to yours of January 6, file 598, No. 20137, quoting various cablegrams and Mr. Schwerin's letter concerning the maintenance of schedules of his vessels and the method of delivering cargo to his vessels, I can only say this in addition to what has been said:

First, that we are not responsible for late departures of his ships, and we are not responsible for any irregularities at the ports of call. We have never asked for but one ship to be held at Ancon to suit our deliveries, and the one that I refer to was the *City of Peking*. This ship and the *Aztec* both arrived at Ancon at the same time, or, in other words, they were both there at the same time to discharge and receive cargo. The *Aztec* was an extra ship brought here for the purpose of cleaning up delayed cargo that had accumulated on account of quarantine.

Their agent insisted upon us working the *Peking* around and ahead of the *Aztec*, so that the *City of Peking* might maintain its schedule. This we agreed

to do, and did do so. The annual holidays were approaching, when we knew that out work would practically come to a standstill for three or four days, which proved to be true. Mr. Pearne insisted on the *City of Peking* going first, and to be sure to have her ready before the holidays. This we did, and gave him cargo for the vessel as he asked for it, but being afraid that the *Aztec* would not get away before being caught by holidays, he intended to let the *City of Peking* go before receiving a full cargo or full tonnage, and arranged her sailing day. When I learned this, I took up the subject with Mr. Pearne, and insisted upon his holding the *Aztec* until she could get a full cargo, as we were extremely anxious to break the congestion and move delayed cargo that had been then long delayed on account of the quarantine, and if the *City of Peking* left light of tonnage it meant so much more left on our hands, not only to injure us in handling business, but to further delay freight that had already been seriously delayed.

With this exception we have never asked during my time here for the holding of any vessel, and, as I showed you in an itemized list of a few days ago, we have maintained schedule time, barring holidays, with two exceptions of one day each, or parts of days, not including the exact hour they arrived, although too late in the day to avail ourselves of that day at the dock.

But the list also shows you that instead of so delaying ships they arrived to us from one to four days later than their schedules; therefore we are not in any way at fault for irregularities in their itinerary.

As to furnishing them cargo as they call for it, I beg to advise you that their cargo is furnished just as their agent calls for it; but it is impossible to anticipate what he is going to call for. That is our greatest source of annoyance. We can not prepare cargo in advance for their sailings, for the reason that we do not know what they will take or at what ports they will call. They change these conditions from time to time, and we are furnished with lists of cargo constantly subject to revision, which revision is made many times after the ships begin to take in; and I sent you copies of some of these notices a few days ago.

But to answer Mr. Schwerin's question to the point, and he is asking what the Panama Railroad will guarantee, I have to answer that if Mr. Schwerin will furnish ships at the proper time, or, in other words, sufficient ships to move the business properly and promptly, the Panama Railroad Company will give him the proper cargo for the ships, providing they will give us ample advance notice as to just what cargo they will take, and then not change it after such cargo is prepared. There is only one difficulty in this question, and that is the holding up of cargo on the Isthmus. If the connecting lines will take their cargo promptly, we have the ability to move and deliver it; but if they tie up our equipment, and tie up our dock space, as they have been doing, then not only is their organization disturbed, but ours is also disturbed, and they have the power to tie our hands. If the cargo is held up by quarantine, as it was formerly, the ship lines nor the railroad is neither at fault, and we have to bear our burdens as best we can.

Now, it is a question, and the only question that I see at stake. Is the Panama Railroad required to and going to build sufficient dock room and maintain sufficient rolling stock to hold back this cargo and allow it to accumulate on the Isthmus to suit the wishes and demands of the ship lines, and have enough of such equipment to hold this cargo and have it on hand to offer to them at any time they call for it, or are the ship lines going to furnish the proper ships at the proper time to take the cargo as it arrives? It seems to me that Mr. Schwerin presents his condition or side of the question and gives a different reason in each explanation. Give us the ships to move the business and we will demonstrate and guarantee to deliver it so long as not prevented in doing so by quarantine or other causes over which we have no control. They can have their cargo any way they want it, so long as it is reasonable, if they will give us ample advance notice as to how they want it and then not change it after arrangements are made.

They speak about their advertised itinerary. I have to advise you that these are changed from time to time as best suits their conditions.

It seems to me that this matter has now reached the point where we have to prove our assertions. We have clearly demonstrated that they have not furnished space and have not received the cargo here for them, and we are asking that they do it now. Let them furnish the vessels for moving the business and force us to prove our ability to do it.

Yours, truly,

W. G. BIERD, Superintendent.

PANAMA RAILROAD,
PANAMA RAILROAD STEAMSHIP LINE,
Washington, January 10, 1906.

SIR: As you are aware, there existed a congestion of freight on the Panama Railroad during the late summer, and conditions did not again become normal until early in December, 1905.

This congestion was due—

First, to the inadequacy of the terminals of the Panama Railroad. Even if these terminals had been in a good state of repair they were not of sufficient capacity to care for the commercial business which the Panama Railroad was called upon to handle. This commercial business materially increased, and about the same time vast amounts of material to be used in the construction of the canal began to arrive on the Isthmus, rendering it impossible to handle the required tonnage with any reasonable promptness or cost.

Second, the supply and character of labor available during the greater part of this period was entirely inadequate, making it impossible to use the facilities available to the best advantage.

Third, the personnel of the Panama Railroad, in charge at the time the congestion was first created, had not been educated on modern lines, and did not possess that resourcefulness which is developed only by years of experience under conditions of dense traffic, which practical railroad men in the States have always to contend with to a greater or less extent.

Fourth, the difficulties to be overcome in relieving this freight congestion were increased by reason of two separate quarantines against the Pacific terminus of the road, thereby complicating the problem of getting rid of the tonnage which the company was enabled to receive at the Atlantic terminus and transport across the line of road.

The management early took steps not only to improve and enlarge existing wharves, but looking to the construction of additional wharves at both ends of the road, and also the putting in of suitable tracks to reach these wharves, and the creation of terminal yards in which to store and switch loads and empties as fast as made. The personnel of the Panama Railroad was reorganized, and the labor supply was increased in quantity, although not in quality.

These actions resulted in cleaning up the accumulation of freight, and early in December conditions became normal. About the same time two new wharves at the Atlantic terminus of the road and one new wharf at the Pacific terminus were put in shape for use, and it was believed that difficulties with freight congestion were overcome, as we were fast getting in shape to handle promptly and economically a much larger business than had ever before been thrown on the road. However, with our preparedness and with freight conditions about normal, and with the heavy coffee movement just about beginning, the Pacific Mail Line of steamers failed to remove its north-bound tonnage from the Pacific side, as set forth in the following cablegram received from the Isthmus:

"JANUARY 3, 1906.

"ISTHMIAN, *Washington.*

"STEVENS: Pacific side, 5,000 tons north; 450 south. Atlantic side, 3,871 north; 2,017 south. Total 8,871 north; 2,467 south. Steamers now at dock take all south; 3,500 tons north; leaving 5,371. Pacific Mail sailing 16th left 780; sailing 22d left 1,900; sailing 26th annulled—no steamer furnished. Besides leaving cargo, they wire return ships empty if necessary. Practically entire equipment under load, besides accumulated on wharves. Began storing new wharf to-day, which means no space receive coffee. Extremely bad if coffee offered. Urge 'Frisco send extra steamer at once. Everything possible done this end. All now depends on Pacific Mail."

This matter was on the same day brought to the attention of Mr. R. P. Schwerin, vice-president and general manager of the Pacific Mail Steamship Company, by my telegram, reading as follows:

"Am advised your ship which sailed from La Boca on 22d left 1,900 tons of freight. Your sailing for 26th has been annulled. Besides leaving cargo you wired return ships empty if necessary. This will result in another tie up. Extremely bad for coffee movement. Can't you possibly send extra steamer at once?"

To which Mr. Schwerin replied the next day as follows:

"Telegram 3d. Panama Line not scheduled line, as you know. If ships hung up in port as they have been Panama, schedule disorganized; impos-

sible make up. *Aztec* now Acajutla. Have wired special agent endeavor rush Panama clean up way freight, amounting some 4,800 tons. Hope you will give such instructions as will unload, load, dispatch *Aztec* with prompt dispatch, so not keep her out of coffee trade."

About the same time that this telegraphic correspondence was being carried on with Mr. Schwerin the traffic manager of the road was in communication with the Pacific Mail people on the same subject.

On January 5th the traffic manager telegraphed Mr. Schwerin as follows:

"Isthmus cables 3,000 tons at Panama ready for delivery, but Pearne calls for cargo not yet discharged from steamers at Colon. Until cars Panama side relieved can not get cargo across. Urgent that Pearne be instructed to arrange special calls to carry forward cargo now at Panama in preference to leaving with space, because he can not get cargo now on Colon side for itinerary ports. What will you do to cooperate?"

To which Mr. Schwerin made the following reply:

"Your telegram 3th. We have endeavored meet conditions at Panama by altering schedules and making additional calls, hoping situation regarding transfer of cargo would improve so our ships could again maintain the itineraries by Central American and Mexican governments. Years of experience has taught the Panama Railroad Company that no connection can maintain a schedule, either local or terminal, under their present methods of handling business. They have had for years a competent method for transferring cargo as called for so that our ships could receive cargo destined to the ports of call on that particular voyage as scheduled, and they should be able to again inaugurate and continue this practice. What guarantee will the Panama Railroad Company give that they will not continue the present practice of sending cargo across the Isthmus for delivery to us regardless of the ports of call of the ships on the berth as provided for on the published schedule and which apparently they seem to be unable to segregate at Ancon? We can not expect any consideration from governmental officers in Central American and Mexican ports if present condition of affairs prevail, and we are unable to give any satisfactory explanation to those Governments covering our apparent total disregard of published schedules for which they hold us strictly accountable. Our obligations in this respect are as binding as those of the Panama Railroad Company to the United States Government, and we must have a guarantee that the cause creating the apparent disregard of published schedules on the Pacific will cease, and we must be placed in a position to satisfy the government of the countries served that the schedules of the through steamers both north and south bound will be maintained. What will the Panama Railroad Company do to cooperate?"

From the two telegrams sent by Mr. Schwerin, above quoted, it will be seen that he offers as an excuse for not promptly taking care of all northbound cargo offered by the Panama Railroad at the Pacific terminus:

First. That their Panama line is not a scheduled line; and

Second. That it is the duty of the Panama Railroad to only tender tonnage for each particular ship which is destined to those ports at which that particular ship is scheduled to call. In other words, if we tender them 5,000 tons of freight for a Central American port, and the ship loading at that time does not contemplate touching at that port, they refuse to accept the freight, even though the ship has available space, but expect the Panama Railroad to provide storage facilities to take care of this tonnage until such time as they have a ship which they contemplate stopping at that particular port.

The Panama Steamship line, as a common carrier out of New York, has to accept freight from shippers as tendered. This freight is delivered on arrival at Colon to the Panama Railroad, which, in turn, must tender it to the connecting steamship line on the Pacific in the order in which it is received. There may have been a time when the traffic of the Panama Railroad was small enough to permit it to assume the burden of becoming a warehouse and clearing house for all steamship lines on both sides of the Isthmus, but to assume that practice under present conditions would mean a constant state of congestion. In fact, the more tracks and cars we placed in service (if the business increased) the greater would be the congestion and consequent cost of handling.

Mr. Schwerin goes even further and asks that certain cargo be held back at Colon in anticipation of steamers arriving later which might have on board

cargo which the Pacific Mail would need to have first. In a cablegram from the superintendent of the railroad, dated the 4th instant, he states that the Pacific Mail people were calling on him for delivery on the Pacific side of a cargo which had not been discharged from the steamer on the Atlantic side, and this at a time when there was other tonnage already on the Pacific side awaiting removal by the Pacific Mail, as set forth in the cablegram quoted in this letter.

It will be seen that Mr. Schwerin states in reply to my statement in my telegram of the 3d that his sailing for the 26th had been annulled, that the Panama Line is not a scheduled line. It would seem as though the telegram from Mr. Schwerin, containing this statement, had been "bulled" in transmission, as they have regular steamers in the service between Panama and San Francisco, and published an itinerary making sailing dates from San Francisco every Saturday, and from Ancon every Tuesday. It may be his statement was intended to convey the idea that if his ships are delayed at ports to any considerable extent the time can not be made up, but this would not seem to make it necessary to annul a fixed sailing date.

The only proper course for the Pacific Mail to adopt, if they desire to properly handle and develop the traffic by the Isthmian route, is to put in service ships that will properly and promptly take care of the business offered. Mr. Schwerin told me last summer, when we settled our difficulties, that his company had provided funds for the construction of new ships for this service, which had been held up pending the settlement of the disputes. I subsequently received the impression from a statement made by Mr. Harriman that they would probably push forward these ships to completion. These statements and impressions led to the hope that the Pacific Mail would heartily cooperate with the Panama Railroad and inaugurate a service that would not only prevent congestion in the future, but assist us in developing the traffic which would naturally seek the Isthmian route under normal conditions of time and fair rates, but the service we have received, and the position taken by the Pacific Mail, as herein indicated, shows that they are not cooperating in the spirit anticipated.

You will readily understand that unless we have a proper outlet on the Pacific side, any efforts which may be made to keep traffic open on the Panama Railroad and Steamship Line must be entirely futile. If the Pacific Mail persists in the course they are now following we must do one of two things—either arrange with other lines to enter into the service in competition with the Pacific Mail or establish a line of our own.

Will you please give me such instructions as the situation warrants with reference to the policy for the Panama Railroad to pursue?

Very respectfully,

T. P. SHONTS, *President.*

The SECRETARY OF WAR.

PANAMA RAILROAD COMPANY,
New York, January 23, 1906.

Mr. R. P. SCHWERIN,
Vice-President and General Manager,
Pacific Mail Steamship Company,
No. 120 Broadway, New York.

DEAR SIR: I duly received your telegram of the 5th instant, but at the same time I received a letter from Mr. Stevens showing that you had already advised him that the *Aztec*, at that time at Acajutla, was expected to clean up the way freight from Panama, and further attention on my part was unnecessary.

I now have letters from the Isthmus which give the necessary information to answer two points in your correspondence.

First. Your telegram January 2, wherein you stated that you "do not understand how it is there should be 9,400 tons freight on Isthmus."

Second. The inference conveyed by your telegram of the 5th that our present methods of handling business differ from those formerly in effect.

As to the first, the dispatch of but three steamers from San Francisco in November, instead of four as provided by your itinerary, was reflected at the Isthmus by the sailing of only the *Peru*, *Newport*, and *San Jose* from Ancon, December 10, 16, and 22, instead of your itinerary sailings of December 4, 11, 18, 24, and 31. The *Newport* December 16 shut out 780 tons cargo, and the little *San Jose* shut out 1,900 tons. Meanwhile cargo had been arriving regu-

larly on the Colon side in large quantities, and taking into account everything afloat and ashore, the situation at the Isthmus showed cargo on hand for you—

	Tons.
December 14.....	2,100
December 20.....	3,200
December 26.....	5,100
January 2.....	9,400

To be more particular, I note that the *San Jose* December 22 took 90 tons cargo for Champerico and left on our hands 187 tons which was ready for delivery. The *City of Peking* January 7 seems to have taken 205 tons cargo for Champerico, including the 187 tons, but she left behind 448 tons, and the *Acapulco*, your following sailing, was not scheduled to call at Champerico. This one port, therefore, tied up 45 cars holding freight over for at least two weeks, besides having to care for the other freight arriving in the meantime for the port. What is true of Champerico is doubtless true of the other ports. The way business has been very large. My latest statistics are up to October, and they show for the ten months 52,000 tons for Central America in 1905, as against 40,000 tons in 1904.

The rapid accumulation in December, as shown above, emphasizes the absolute necessity of putting in extra steamers for the coast service whenever there is any disruption of the regular itinerary from any cause. In fact, it may be that the time has arrived to reestablish an auxiliary coast service such as you maintained before the weekly through service was established. It is absolutely necessary for the relief of all concerned that every one of our cocarriers on both sides of the Isthmus shall move promptly the freight which arrives on the opposite side for that cocarrier. This is no new proposition; we have corresponded about it from time to time in years past.

Regarding the second point, Mr. Blerd advises that all cargo is delivered as your agent asks for it, to the extent of our ability. This is the precise method that has been practiced for years. We must send cargo across the Isthmus very nearly in the order of its arrival, or the docks become congested at Colon. The theory of the business has always been to load cars directly from the ships, and that within a reasonable time ships on the opposite side should take it directly from the cars and carry it forward. When our entire equipment is loaded our cocarriers must accept the cargo from the cars rather than insist upon getting the cargo from the opposite side which may still be on board ship, and for which there are no empty cars to receive it. Mr. Pearne's demand upon Mr. Blerd for cargo in Colon, of which I advised you in my telegram January 5, is only a repetition of similar demands made upon former superintendents.

Taking again for illustration cargo for Champerico, that which went forward on the *City of Peking* January 7 accumulated at the Isthmus between December 8 and 19, while the 448 tons accumulated between December 17 and January 3. Perhaps your itinerary should be revised to cover weekly calls at Champerico and less frequent calls at some other ports.

I have written the above thinking it may bring to your attention a combination of circumstances which may not have appealed to you in the advices which you have naturally received from Mr. Pearne, and in the hope that you will devise means to keep the Isthmus clear in the mutual interest of all concerned.

Yours, truly,

R. L. WALKER, *Traffic Manager.*

PANAMA RAILROAD COMPANY,
New York, February 4, 1906.

Mr. T. P. SHONTS,

President Panama Railroad Company, Waldorf-Astoria, City.

DEAR SIR: Complying with your request for "comparative-tonnage" statements by months in connection with the testimony of R. P. Schwerin before the Senate Committee on Interoceanic Canals, I submit here figures showing:

Tonnage interchanged with Pacific Mail Steamship Company in 1904 and ten months of 1905. The figures for November and December, 1905, are not yet at hand.

Increase in tonnage by our line from New York for local consumption at the Isthmus in 1905 over 1904; also tonnage delivered to us by other steamship

lines at Colon for consumption at Panama during ten months of 1904 compared with ten months of 1905.

Total annual movement by Panama Railroad since 1895.

I trust the statements will give all the details that you wish. Exhibit L, page 30, of the report to the board of directors of the Panama Railroad for ten months to October 31, 1905, will perhaps be interesting in this connection.

Yours, respectfully,

R. L. WALKER, *Traffic Manager.*

Total tonnage moved by Panama Railroad Company annually from all points to all points.

	Tons.		Tons.
1895	271,063	1900	357,377
1896	279,197	1901	385,584
1897	290,651	1902	346,689
1898	268,156	1903	349,538
1899	287,400	1904	414,649

Ten months, January to October, inclusive—

	Tons.
1904	339,464
1905	444,230

Increase, 1904 over 1903, 18.63 per cent.

Increase, 1905 over 1904, 30.86 per cent.

NEW YORK, *February 4, 1906.*

Tonnage by Panama Railroad Steamship Line from New York for Colon and Panama—Local.

Month.	1904.	1905.
	<i>Tons.</i>	<i>Tons.</i>
January	1,364	3,246
February	1,615	3,691
March	1,921	3,386
April	1,268	14,595
May	1,531	3,970
June	1,475	4,464
July	1,954	4,337
August	2,379	5,909
September	2,022	6,602
October	2,630	5,002
November	2,681	4,618
December	3,014	5,475
Total	23,854	65,296
Ten months, January to October:		
From New Orleans for Panama	699	2,044
From Europe for Panama	4,508	8,643
	5,207	10,687

^a Including 200 flat cars.

Panama Railroad Company has no statistics of tonnage taken to Panama by steamers on the Pacific Ocean or taken to Colon by steamers on the Atlantic Ocean (other than by its own line from New York) for local consumption on the Isthmus.

Mr. Schwerin is very much astray in his testimony (page 420) about increase of tonnage for local consumption on the Isthmus.

NEW YORK, *February 4, 1906.*

INVESTIGATION OF PANAMA CANAL MATTERS.

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Tonnage interchanged with Pacific Mail Steamship Company at Panama.

Date.	Westbound from United States and Europe to—			
	Central America.	Mexico.	San Francisco and beyond.	Total.
1904.				
January	Tons. 3,359	Tons. 277	Tons. 2,427	Tons. 6,063
February	3,115	811	3,010	6,436
March	4,070	392	5,143	9,605
April	3,263	309	4,355	7,927
May	3,886	335	5,067	9,306
June	3,702	306	5,040	8,048
July	3,900	325	3,566	7,831
August	4,240	571	3,437	8,248
September	4,460	314	2,530	7,304
October	5,876	255	2,077	8,208
November	39,871	3,396	35,702	78,968
December	4,607	253	3,173	8,033
December	4,922	249	3,221	8,392
Total	49,400	3,897	42,086	95,383
Date.	Eastbound to United States and to Europe from—			
	Central America.	Mexico.	San Francisco.	Total.
1904.				
January	Tons. 4,137	Tons. 296	Tons. 2,088	Tons. 6,521
February	11,314	147	1,788	13,249
March	11,329	259	1,928	13,516
April	7,664	36	2,532	10,232
May	2,603	217	2,688	5,502
June	5,936	2	2,864	8,802
July	2,207	189	4,166	6,512
August	1,798	16	2,325	4,139
September	1,048	13	1,953	3,014
October	539	34	2,711	3,284
November	43,575	1,159	25,087	74,771
December	1,219	70	2,804	4,093
December	2,715	122	3,612	6,449
Total	52,509	1,351	31,458	85,313
Total east and west bound, 12 months	101,909	5,248	73,549	180,706
Date.	West bound from United States and Europe to—			
	Central America.	Mexico.	San Francisco and beyond.	Total.
1905.				
January	Tons. 5,307	Tons. 282	Tons. 3,173	Tons. 8,762
February	5,467	294	2,981	8,742
March	5,449	307	2,414	8,170
April	6,754	311	4,313	11,378
May	4,692	418	2,855	7,965
June	5,897	372	3,334	9,603
July	3,435	189	2,858	6,482
August	5,126	446	2,627	8,199
September	4,834	353	1,879	7,066
October	4,990	341	2,336	7,675
Total	51,959	3,313	28,770	84,042

Tonnage interchanged with Pacific Mail Steamship Company at Panama—Continued.

Date.	East bound to United States and to Europe from—			
	Central America.	Mexico.	San Francisco.	Total.
	<i>Tons.</i>	<i>Tons.</i>	<i>Tons.</i>	<i>Tons.</i>
January.....	7,262	48	8,125	10,435
February.....	10,784	61	2,568	13,413
March.....	9,597	16	1,974	11,587
April.....	8,407	160	2,496	11,063
May.....	2,179	25	2,524	4,728
June.....	3,293	103	1,985	5,381
July.....	1,707	99	3,433	5,239
August.....	1,701	145	1,977	3,823
September.....	606	29	1,162	1,797
October.....	1,003	103	2,801	3,907
Total.....	46,589	789	23,985	71,313
Total east and west bound, 10 months.....	98,496	4,102	52,755	155,355

PANAMA RAILROAD COMPANY,
New York, February 9, 1906.

Mr. T. P. SHONTS,
President Panama Railroad Company, Washington, D. C.

DEAR SIR: Referring to my respects of December 8, regarding the attitude of the Pacific Mail Steamship Company toward our rates from New York to Central America and Mexico, I invite your attention to the inclosed copy of a letter which Mr. Schwerin addressed to me from Washington, 6th instant, and to copy of the reply which I am making to Mr. Schwerin this date, which I trust may meet with your approval.

Yours, respectfully,

R. L. WALKER,
Traffic Manager.

WASHINGTON, D. C., February 6, 1906.

R. L. WALKER, Esq.,
Traffic Manager Panama Railroad Company, New York.

DEAR SIR: Referring to your tariffs of freight rates, issued under date of New York, December 15, 1905, No. 1 covering rates New York to Mazatlan and No. 3 covering rates New York to Central American ports and Mexican ports:

Hereby beg to serve notice on you that as said tariffs were issued without having been submitted to us and our approval obtained thereto, and as the rates provided for in said tariffs are lower than the rates heretofore mutually agreed upon, we will decline to accept said tariffs and the rates therein provided for, and furthermore that on all traffic which we may handle to the ports covered by said tariffs we shall expect to receive from you, as our proportion of the through rate, the same revenue as received by us prior to December 20, 1905.

Will you please acknowledge to me the receipt of this letter?

Yours truly,

R. P. SCHWERIN,
Vice-President and General Manager.

PANAMA RAILROAD COMPANY,
New York, February 9, 1906.

Mr. R. P. SCHWERIN,
Vice-President and General Manager Pacific Mail
Steamship Company, No. 120 Broadway, New York.

DEAR SIR: I have your letter dated at Washington, 6th instant, serving notice that you expect us to account to you for cargo to Central America and Mexico on the basis of tariffs existing prior to these which we made effective in December last, on the ground that the latter were not submitted to you for approval before issue.

You appear to have overlooked the conditions under which our companies are interchanging traffic at Ancon, which give the initial carrier the right, subject to certain minima, to make rates between "United States Atlantic coast ports and Mexican or Central American ports and between Mexican and Central American and European ports."

This right has existed ever since December, 1900, when the contract between us of 1895 expired, and we reduced the rates from New York to approximately those from Europe.

When our mutual relations were resumed, in June, 1902, you accepted without question the then existing tariffs which had been established by the Atlantic lines from Europe and by our line from New York. In further exercise of the rights conferred as above, the initial carriers have since changed the tariffs from time to time, notably when the lines from Europe to Colon reduced the rates from 45/ to 40/ on 5-ton lots of bricks, cement, coal, coke, iron and steel bars, axles, wheels, and soda (ash, caustic, hyposulphate, and silicate), fish plates, hoops, pig, plates, rails, sheets, and besides pig lead and salt in bags, when we issued the tariff of August, 1905, from New York, and when your own company as recently as November 17 last issued Supplement No. 5 to Tariff No. 32, making rate on goats' hair to Europe 37/6 per 40 cubic feet.

It is your undoubted right to question our action in reducing the rates from New York to Central America and Mexico for bricks, coal, iron, etc., in 5-ton lots below the agreed minima of 50 cents and 60 cents per 100 pounds, but is it just to do so? You made no demur to the reduction to 40/ per ton made by the foreign steamship lines from Europe under their right to go as low as 35/ per ton.

We have made the rate 45 cents per 100 pounds from New York to be in line with the above rate from Europe.

On cargo from Europe to Central America you receive 35 per cent of the through revenues, on cargo to Mexico 37½ per cent, on cargo from New York to both Central America and Mexico you receive 40 per cent. It is not unreasonable for us to expect you to join us in rates as low from New York as from Europe, particularly when, if traffic moves from New York which may heretofore have gone from Europe, you will receive a greater revenue for the same service, the haul from Ancon to destination.

I trust that you will give further consideration to the subject, and until hearing from you again we will make no change in our accounting.

Yours, truly,

R. L. WALKER, *Traffic Manager.*

Panama Railroad Company mail earnings.

	1904.	11 months of 1905.
Railroad	\$87,687.56	\$76,982.31
Steamship	107,987.48	113,075.00
Total	195,675.04	190,057.31

Of 1905 earnings following was paid by the United States:

Railroad	\$57,412.74
Steamship:	
Post-Office Department	94,015.70
Isthmian Canal Commission	3,268.60
Total	154,697.04

Of the amount paid by the United States \$39,730.42 was account of European mails, transportation for which was collected by the United States Government from other governments.

E. S. BENSON, *General Auditor.*

FEBRUARY 3, 1906.

New locomotive and car equipment for Panama Railroad Company.

Class.	When ordered.	Number delivered.	When remainder will be delivered.
24 locomotives.....	April 29, 1905	22	February 17, 1906.
500 box cars	June 9, 1905	125	Balance will follow at rate of about 125 each two weeks.
12 caboose cars .....	.....do.....	.....
6 passenger coaches .....	.....do.....	.....

New locomotive and car equipment for Isthmian Canal Commission.

Class.	When ordered.	Number delivered.	When remainder will be delivered.
200 flat cars.....	Oct. 29, 1904	200	Balance will be delivered by March 31, 1906.
324 dump cars	Jan. 20, 1905	314	
300 flat cars.....	May 3, 1905	300	
800 flat cars.....	Feb. 14, 1905	800	
	Oct. 10, 1905		Delivery will commence as soon as delivery of box cars for Panama Railroad Co. is completed, and they will all be delivered by May 31, 1906.
120 locomotives.....	Sept. 20, 1905		Delivery will commence as soon as delivery of locomotives for Panama Railroad is completed and they will all be delivered by June 30, 1906.

A large-capacity derrick for use in unloading heavy materials from vessels was delivered in November, 1905, and erected on Dock No. 11, Cristobal, in the canal, and is being used now to good advantage in handling the heavy and cumbersome equipment being unloaded there.

A large steam cantilever traveling crane, covering an area of 340 by 600 feet, has also been erected on Dock No. 14, Cristobal, in the canal, having been placed in service January 6 last. It is estimated that this crane will perform as much service in the way of unloading and carrying away from the dock heavy and cumbersome material as has heretofore been performed by 300 laborers.

A car crane for handling lumber at La Boca and two 75-ton self-propelling cranes for the Panama Railroad, one 10-ton, two 20-ton, and one 100-ton cranes for the Isthmian Canal Commission have also been purchased and delivered for use in loading on and unloading heavy materials from cars and for other purposes.

A modern coal-unloading and storage plant, to be erected at Cristobal, was ordered in August last and will be delivered about the last of this month, which it is estimated will reduce the cost of handling coal from ship to engines from \$1.30 to about 12 cents per ton.

I mention these things to show that the railroad company and the Commission have appreciated the necessity for and have made the necessary arrangements to get such suitable, modern facilities as will enable them to handle their business economically and satisfactorily.

T. P. SHONTS.

WASHINGTON, D. C., February 19, 1906.

[Copy of cablegram sent.]

FEBRUARY 2, 1906.

STEVENS, Panama:

Schwerin made following statements before Senate committee:

First. That in December (presumably 1904) we reduced wages employees La Boca, resulting in our employees and theirs quitting, which was beginning congestion at Isthmus; that we are now paying more than before reduction. Advise facts.

Second. That our former custom was to give them freight as they desired in order of port calls, which we have discontinued. Advise facts. Do lines running south require this?

Third. That during 1905, in addition to regular lay days, their steamers were delayed one hundred and thirty-seven days, one hundred and eleven of which were

since June 1. Cable names and dates steamers delayed beyond regular lay days and number days delayed.

Fourth. That their steamers are delayed waiting for coal, *Newport* having been delayed full day this account after loaded. Advise facts. Also cable names steamers and dates they sailed with space available when we had cargo which could have been given them.

SHORTS.

[Translation of cablegram received from Panama.]

FEBRUARY 7, 1906.

SHORTS, *Washington*:

Referring to telegram from your office of the 2d instant relative to Pacific Mail Steamship Company:

First. Owing to rise silver 40 to 50 cents November, 1904, company reduced wages 10 cents on the dollar, equalizing change in silver, leaving wages exactly the same. Men struck for nine days, causing temporary congestion, which was entirely cleaned up. Conditions normal in three weeks, during which time some ships went out light.

Second. Freight is and has been at all times given Pacific Mail Steamship Company exactly as called for by written order of their agent. We have on file all these orders, which have been strictly followed. Every ship that sailed, regular or irregular, southern lines, order and receive freight in the same manner.

Third. In every case we have maintained lay-over time excepting where Pacific Mail Steamship Company have bunched their ships regardless of schedule, and we have at their request worked irregular ships around regular schedule ships. Cases recorded where they have bunched five ships at La Boca at one time. Letter in detail goes to you to-morrow.

Fourth. Not a ship has been delayed for coal during the past year excepting the *Newport*; had to take coal from the Pacific Steam Navigation Company, as we did not have coal on the Isthmus.

Fifth. All through ships have taken full capacity, but coastwise vessels have gone light, taking freight only for certain ports of call. We do not keep this record, but know this to be true beyond question. Congested situation arose from Pacific Mail Steamship Company failing to give us sufficient ships of the proper size; they first refused to receive unidentified packages with or without short-ship paper. Later, after taking up with consuls, received such freight.

STEVENS.

OFFICE OF GENERAL SUPERINTENDENT,
PANAMA RAILROAD COMPANY,
Colon, February 8, 1906.

Mr. T. P. SHORTS,
*President Panama Railroad Company,
Isthmian Canal Commission, Washington, D. C.*

DEAR SIR: I cabled you yesterday in answer to your message of February 6 in regard to alleged delays to the Pacific Mail ships at Panama, as evidenced by Mr. Schwerin's testimony before the Senate committee.

In my message I covered, as well as I could, practically all the questions you asked, and advised you that a letter would follow on to-day's ship giving the details.

The inclosed statement, which we made up from our actual records, gives the facts in the case, showing delays in the sailings of their ships from May 21 to December 31, covering practically the period of time in which Mr. Schwerin referred in saying that there had been one hundred and eleven days delay to ships chargeable to our account.

The statement as made up shows, as per heading for each ship, the scheduled date of arrival and the actual date of arrival, the scheduled date of departure and the actual date of departure, the time which was lost at La Boca by reason of what might be called "causes of our own."

It would seem at first glance that even if the ship arrives late that it should make no loss of time in departure, but the facts are, that when these ships get off of their time in arriving, that they get bunched, and not only make confusion and congestion of ships at the docks, but also result in cutting out or annulling intermediate sailings, and you will remember that this statement only gives the record of the

ships which have been delayed by reason of the two causes as shown in the heading, by themselves and by us, and that there were other sailings which arrived and departed promptly on time.

The time lost at La Boca on account of delays which may be supposed to be on railroad account is eighty-five days instead of one hundred and eleven, as alleged by Mr. Schwerin, and by going through the remarks I would call your attention to the fact that the *Acapulco*, arriving June 7, was bunched with the *City of Peking* and *Guatemala*, both Pacific Mail ships, and this bunching resulted in one day's delay, which was charged to our account but not justly.

The *City of Panama*, arriving on June 23, shows a delay on our account of two days, but La Boca port, while the *City of Panama* and the *City of Para* as shown next, also the *San Juan*, *Aztec*, and *City of Sydney* carrying us up to July 14, was closed on account of quarantine, and we are charged on account of these ships with twenty-nine days' delay, which is not our fault at all, as we can not control Government regulations, and are no more responsible for these delays than we would be in case the machinery of one of their ships broke down at sea.

On some other occasions you will note, as for instance the *Acapulco* arriving on October 22, we were charged with six days' delay; the 3d, 4th, and 5th of November were national feast days, and the steamer's men did not show up for work, therefore three of these days of delayed time we are not responsible for. The same situation arose with the *City of Para*, which arrived on October 28, owing to feast days on the 3d, 4th, and 5th shipmen did not report, consequently the ship could not be worked, no fault of ours or of their own; instead of eight days' delays as was charged, there were but five that could possibly be on our account.

The *City of Panama*, arriving on November 7, found the *Acapulco* and *City of Para*, both Pacific Mail ships, bunched, making three of their ships here at the same time, and none of this three days' delay is chargeable to us. The steamer *San Juan*, which arrived November 14, found the same condition, three of their ships were in the berths, and the days' delay charged to us is not ours.

The *City of Peking* arriving on December 28, we are charged with one day's delay; this is a legal holiday and we are not responsible for the delay.

Altogether, owing to the causes I have mentioned, forty-eight days out of the eighty-five, as shown on the statement, we are absolutely blameless.

It must be remembered, too, that our records are rather misleading, for the reason that if a ship arrives late in the afternoon we are charged up with that full day, and also, even if she is ready to leave at 7 o'clock in the morning; and altogether, taking the records, they show that probably instead of eighty-five days we are actually responsible for not over twenty days for any legitimate cause whatever. And, on the contrary, which this statement does not show, we have repeatedly saved them a number of days in handling their ships in less than the regular lay time, so that on the whole, giving us credit for the time we have saved on the ships, which the statement does not show, we have undoubtedly shown them time on the net balance instead of losing. And it must also be remembered, as shown in the note attached, that by the withdrawal of two sailings from San Francisco, the loss represents eighteen days, in which cargo accumulates, all of which tends to aggravate the congestion.

I hope that this statement will make the matter clear, if you will study it carefully, bearing in mind the facts of bunching, the withdrawal of sailings on account of irregular sailings for which we are not responsible, the placing of quarantine by the action of foreign nations, and the holidays and feast days, which are a contingency that the Pacific Mail or any other transportation company doing business in this country must bear, and for which we are in no way responsible. You will see that our record is very clear, in fact, it is much better than we expected, and we had it gone into to get these figures. I do not believe there is a port in Central or South America that can show a better record, taking into consideration the handicaps which I mentioned above.

Generally, as I cabled you, you are safe to say this:

That the congestion, so called, arises from the fact, which can be duly proved, that the Pacific Mail Company has not, from causes for which we are not at all responsible, furnished the requisite number and character of ships to handle the business out of La Boca as a transportation proposition, by character of ships—I mean ships that he has furnished us on the schedule. Many of them have been too small capacity to take the business that was offered. For instance, the *San Jose*, *Para*, and the *Aztec* and *City of Peking* are ships from 4,000 to 5,000 tons, while all of the others are of too small capacity for the trade.

Truly, yours,

JNO. F. STEVENS,
Vice-President.

NOTE.—Included in the Panama Railroad delay there is to be considered five holidays, viz, the 3d, 4th, 5th November, the 28th November, and the 1st January, 1905. Also the withdrawal of two sailings from San Francisco represents eighteen days in which cargo accumulated.

1905.

Name of steamer.	Itinerary date of arrival.	Actual date of arrival.	Itinerary date of departure.	Actual date of departure.	Time lost through late arrival.	Delay above-scheduled lay days.	Remarks.
City of Peking.....	May 21.....	May 28, at 2 p. m. at dock.	May 30.....	June 7, at 7 p. m.....	Days. 7	0	Began working at La Boca wharf 6 a. m. 29th. Worked 29th, 30th, 31st; June 1, 2, 3, 4, 5, 6, and 7. Finished work at 4 p. m. of 7th, and left for sea at 6 p. m.
San Jose.....	May 28.....	May 29, at 8.45 a. m., at bay.	June 6.....	June 9.....	1	2	City of Peking was at dock as well as Tucapel. There was no vacant berth. Worked San Jose at bay in launches, both loading and discharging.
Barracouta.....	.....	June 6. a. m.....	.....	June 18, p. m.....	.....	.....	This being an extra boat does not figure on itinerary. On 6th and 7th was waiting at bay for berth. L.B. wharf occupied by Peking and Guatemala. When latter left she came in. Worked: 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, and 18. Very little work 11th, Sunday. Ship could not get men from Guatemala. We worked one gang only.
Acapulco.....	June 4.....	June 7, 3.30 p. m., at bay.	June 13.....	June 20.....	3	1	City of Peking and Guatemala at dock 8, waiting for berth. Working; berth left vacant by Guatemala. No work 11th, Sunday; ship could not get men. No work 18th, Sunday; ship could not get men. All day 19th in unloading and discharging San Jose.
City of Para.....	June 11.....	June 18, 5 a. m., Sunday.	June 20.....	June 28, at night.....	7	0	Worked at L.B. wharf: 19, 20, 21, 22, 23, 24, 25. Quarantine enforced p. m. of 25th. La Boca port closed. Ship remained at Bay on account of quarantine restrictions until night of the 28th, when she sailed.
City of Panama.....	June 18.....	June 23, a. m.....	June 27.....	July 3, 8 p. m.....	5	2	La Boca port closed on account of quarantine. Had to do all the work in launches, 23d, 24th, and 25th, unloading into launches, part of which were occupied handling cargo to and from Limari.
Peru.....	June 25.....	June 29.....	July 4.....	July 19, at 2 p. m.....	4	8	La Boca port closed on account of quarantine. City of Panama and Limari so loading and unloading into launches at bay June 28, 30, July 1, 2, 3, July 4, official holiday, no work. Working: July 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17. Finished at Panama wharf 2 p. m. 17th; last launch sent ship that date. Delay on 18th and 19th due to ship not finishing taking in cargo from launches.
San Juan.....	July 2.....	July 2, 10 a. m.....	July 11.....	July 18, 2 p. m.....	0	5	Port closed at La Boca, quarantine. City of Panama, Peru, and San Juan, loading and unloading into launches at bay at same time, 3d, 4th, official holiday, no work. Working, 5, 6, 7, 8, 10, 11, 12, 13, 14, 15 and 17th. 9th and 16th, Sundays, no work. Men did not show up at dock.

1905—Continued.

Name of steamer.	Itinerary date of arrival.	Actual date of arrival.	Itinerary date of departure.	Actual date of departure.	Time lost through late arrival.	Delay above scheduled lay days.	Remarks.
					Days.		
Azteco.....	July 9	July 9, a. m.	July 18	July 30, 6 p. m.	0	12	La Boca port closed account quarantine. Peru, San Juan, and Loa loading and unloading into launches at bay at the same time. All launches busy. Worked. 9, 10, 11, 12, 13, 14, 15, and 16th. Port of La Boca opened on 17th, and work at La Boca wharf started at 6 a. m. Worked. 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, and 29th. Finished 8 a. m., 30th; ship left for bay at 11 a. m. Aztec at anchor 8 days. Preference given to Peru and San Juan, which were mail steamers. La Boca wharf closed by quarantine until the morning of the 17th. Peru and San Juan at bay loading and unloading into launches; also working City of Sydney into launches. Working: 14th, 15th, 17th, 18th, 19th, 20th, 21st, 22d, 23d, 24th, 25th, 26th, and 27th. Finished on the 27th. Sunday, 16th, no men at work. From the 17th, date on which La Boca wharf was reopened to traffic by quarantine department, the Aztec took one berth, while the other had to be dredged and was given to the Ellerie, I. C. C. lumber ship, on the 25th, to the exclusion of P. S. N. steamer Pizarro.
City of Sydney	July 16	July 14, 7 a. m.	July 25	July 27, p. m.	0	2	One berth at La Boca was occupied by the Aztec, while the other was being dredged. On the 25th the Ellerie, I. C. C. lumber ship, came alongside and started discharging lumber. Working into launches at bay: 19th, 20th, 21st, 22d, 23d, 24th, 25th, 26th, 27th, 28th, and 29th. Sydney was using part of the launches at bay at the same time. On the 30th Newport docked in the berth of the Aztec and started loading. Worked: 31st, Aug. 1, 2, 3, 4, and 5. Finished 2 p. m., 6th. La Boca wharf occupied by Newport and Ellerie. All launches in the service of San Jose and City of Peking loading and unloading on July 1, August 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, and 19. Finished on the 19th.
Newport.....	July 23	July 19, at 8 a. m.	Aug. 1	Aug. 5, 4 p. m.	0	4	Newport and Ellerie at La Boca wharf. San Jose worked at bay from 1 p. m., and launches were sent down bay.
City of Peking.....	July 30	July 31, early a. m.	Aug. 8	Aug. 20, 6 a. m.	1	11	Ellerie and Pass of Melfort at La Boca wharf discharging lumber. The Ellerie left La Boca wharf on the 20th. City of Para docked on the 20th and started working on the 21st at 6 a. m. On the 19th and 20th she discharged into launches, and on the 21st, 22d, 23d, 24th, 25th, 26th, 27th, 28th, and 29th worked at La Boca wharf. Finished 30th at 11 a. m.
San José.....	Aug. 6	Aug. 1, 11 a. m.	Aug. 15	Aug. 12, 10 a. m.	0	0	
City of Para	Aug. 13	Aug. 19, 6 a. m.	Aug. 22	Aug. 30, 2 p. m.	6	2	

Acapulco.....	Aug. 20	Aug. 22, early a. m.	Aug. 29	Sept. 2, 6 p. m.	2	2	Pass of Melford (lumber ship for I. C. C.) and City of Para at La Boca wharf. Worked all cargo, loading and discharging with launches: 23d, 23d, 24th, 25th, 26th, 27th, 28th, 29th, 30th, 31st, and Sept. 1. Finished Sept. 1.
City of Panama	Aug. 27	Aug. 29, 2 p. m.	Sept. 6	Sept. 9, 2 p. m.	2	1	Pass of Melford (lumber ship for I. C. C.) and City of Para at La Boca wharf. On the 30th La Boca wharf again placed under quarantine until Sept. 3. Worked all cargo, loading and discharging with launches: Aug. 30, 31, Sept. 1, 2, 3, 4, 5, 6, 7, and 8. Finished night of the 8th, and launches were sent down to the bay.
San Juan	Sept. 3	Sept. 4 at 8 a. m.	Sept. 12	Sept. 13, 10.30 p. m.	1	0	Pass of Melford (lumber for I. C. C.) at La Boca wharf. San Juan discharged part of her cargo into launches Sept. 4, 5, and 6. Came alongside La Boca wharf and started loading and unloading Sept. 7. Worked 7, 8, 9, 10, 11, and 12. Finished on 13 at 2 p. m.
(Sailing withdrawn) ..	Sept. 10	.....	Sept. 19	.....	2	0	On the 19 started working at La Boca pier; continued on 20, 21, 22, 23, 24, 25, and 26. Finished at 11 p. m. on 27.
City of Sydney	Sept. 17	Sept. 19, early a. m.	Sept. 26	Sept. 27, p. m.	6	0	Started working at La Boca pier at 7 p. m. of 30th. Discharged part of cargo into launches, and loaded all at La Boca wharf, Oct. 1, 2, 3, 4, 5, 6, 7, and 8.
Peru.....	Sept. 24	Sept. 30, 10.30 a. m.	Oct. 3	Oct. 9, 5 p. m.	1	2	La Boca wharf occupied by Pacific Mail steamer Peru and P. S. N. steamer Peru. All cargo worked with launches on the 23, 34, 4th, 5th, 6th, 7th, 8th, 9th, 10th, 11th. Finished on the 12th.
Newport	Oct. 1	Oct. 2, early a. m.	Oct. 10	Oct. 13, 7 p. m.	2	0	Aconcagua at La Boca wharf. San José came alongside La Boca pier a. m. of 11th and started working at 1 p. m. Worked 12th, 13th, 14th, 15th, 16th, 17th. Finished at 11 a. m. on the 18th.
San José.....	Oct. 8	Oct. 10, 3 p. m.	Oct. 17	Oct. 18, 4 p. m.	2	0	Extra steamer. At La Boca wharf we had San José and Chile up to the pier 18th and City of Peking and Aztec from 19th up to Nov. 2. Aztec unloaded into launches 12th, 13th, 14th, 15th, 16th, and 17th. At pier 18th, 19th, 20th, 21st, 22d, 23d, 24th, 25th, 26th, 27th, 28th, 29th, 30th, 31st, and Nov. 1.
Aztec.....	.....	Oct. 12, a. m. ....	.....	8 p. m., Nov. 2.	2	7	At La Boca pier we had San José and Chile working. City of Peking discharged into launches on 17th and 18th. Came to wharf on 19th. Worked at pier 19th, 20th, 21st, 22d, 23d, 24th, 25th, 26th, 27th, 28th, 29th, 30th, 31st, Nov. 1.
City of Peking.....	Oct. 15	Oct. 17, early a. m.	Oct. 24	Nov. 2, 6 a. m.	3	6	At La Boca wharf Aztec and City of Peking working. Acapulco discharged into launches Oct. 26, 27, 28, 29, 30, and 31. Came to dock and started working Nov. 2. Worked 6th, 7th, and 8th. Finished at 11 a. m. on the 9th. The 3d, 4th, and 5th being national feast days, the steamer's men did not show up for work, consequently there was no work done on the three days mentioned.
Acapulco.....	Oct. 22	Oct. 25 at 2 p. m.	Oct. 31	Nov. 9 at 6 p. m.	4	1	At La Boca pier, City of Sydney and Colombia. Peru came alongside at 5 p. m. on the 30th and worked Dec. 1, 2, 3, 4, 5, 6, 7, 8, and 9. Finished at 11 a. m. on the 10th.
Peru.....	Nov. 26	Nov. 30, 7 a. m.	Dec. 6	Dec. 10, 12.30 p. m.	2	2	At La Boca pier, Palena and Peru. Newport at bay waiting for berth and in the meantime discharging into launches, Dec. 5, 6, 7, 8, and 9. Docked on the 10th and worked 10th, 11th, 12th, 13th, 14th, and 15th. Finished on 16th.
Newport.....	Dec. 3	Dec. 5, 6 a. m.	Dec. 12	Dec. 16, 5 a. m.	2	0	At La Boca pier, Peru and Newport. San José at bay waiting on berth. In the meantime discharged into launches on Dec. 13, 14 and 15. Docked and worked: 16th, 17th, 18th, 19th, 20th, and 21st. Finished.
San José.....	Dec. 10	Dec. 12, 2 p. m.	Dec. 19	Dec. 22, 7.30 a. m.	2	0	
(Sailing withdrawn) ..	Dec. 17	.....	Dec. 26	.....	2	0	

1905—Continued.

Name of steamer.	Itinerary date of arrival.	Actual date of arrival.	Itinerary date of departure.	Actual date of departure.	Time lost through late arrival.	Delay above scheduled lay days.	Remarks.
City of Para.	Oct. 28	Oct. 28, 6 a. m.	Nov. 7	Nov. 16, p. m.	Days. 0	8	Azteco and City of Peking, occupying all berths at La Boca pier. City of Para discharged into lighters: 28, 29, 30, 31, and Nov. 1. Came to dock Nov. 2 and started discharging and loading. Worked: 2, 6, 7, 8, 9, 10, 11, 12, 13, 14 and 15. Owing to feast days of 3, 4, and 5, ship's men did not report for work on said dates.
City of Panama	Nov. 4	Nov. 7, 6 a. m.	Nov. 14	Nov. 20	3	4	At La Boca pier we were working Acapulco and City of Para. City of Panama waited in bay 7 and 8 for berth, and came alongside pier after City of Para left. Worked: 9, 10, 13, 14, 15, 16, 17, 18, and 19. Finished on 19. No work on 11 and 12 for lack of cargo from Colon.
San Juan	Nov. 12	Nov. 14, 6 a. m.	Nov. 21	Nov. 24, 8 a. m.	2	1	At La Boca pier we had City of Para and City of Panama. San Juan took the berth of the City of Para on the 16th, and worked 16th, 17th, 18th, 19th, 20th, 21st, 22d, and 23d. Finished on 23d.
City of Sydney	Nov. 19	Nov. 20, 10 a. m.	Nov. 28	Nov. 30, 2.45 p. m.	1	0	At La Boca pier San Juan and Loa. City of Sydney waited at bay for berth, in the meantime discharging into launches: Nov. 21, 22, 23, 24th. Came to dock on the 24th, and worked 25th, 26th, 27th, 28th, and 29th. Finished at 11 a. m. 30th.
City of Peking	Dec. 24	Dec. 28, a. m.	Jan. 2	Jan. 7, at noon	4	1	Came alongside La Boca wharf at p. m. 28th and worked 28th, 29th, 30th, 31st, Jan. 2, 3, 4, 5, and 6. Finished at 11 a. m. the 7th. No work on the 1st. Legal holiday.
Acapulco	Dec. 31	Jan. 3, a. m.	Jan. 9	Jan. 13, 10 a. m.	3	1	At La Boca pier: Tucapel and City of Peking. Acapulco discharged at bay into launches on 3d, 4th, 5th, 6th, docked at 2 p. m. on the 7th, and worked 7th, 8th, 9th, 10th, 11th, 12th, and finished on 13th.
Total					76	86	

[Translation of cable received from Panama.]

PANAMA, 1.53 p. m. February 15, 1906.

SHONTS, Washington:

With probably the heaviest coffee movement for ten years there is not to-day one ton of delayed freight on the Isthmus.

STEVENS.

STATEMENT OF THEODORE P. SHONTS, CHAIRMAN ISTHMIAN CANAL COMMISSION, REGARDING TESTIMONY OF MR. J. F. WALLACE AS TO THE ESTABLISHMENT OF A FLAT RATE FOR THE HANDLING OF FREIGHT BY THE PANAMA RAILROAD COMPANY ACROSS THE ISTHMUS.

Generally speaking railroad rates are based on the character and value of the freight to be handled. It goes without saying that heavy freight of low value, on which there is little risk of damage in transporting and handling, should be carried at a lower rate than freight of higher value or bulkier character or of a more fragile nature on which there is greater risk of damage in transporting and handling, and of which the cost of transporting and handling is greater. In other words, the freight rate, generally speaking, increases as the value and the risk in transporting and handling increases.

If a flat rate for all kinds of freight were put into effect on any road it would mean that the rates on the low-grade freight, least able to stand an increase, would have to be increased to offset the decrease on the high-grade freight.

It does not follow from the fact that the Government now owns the stock of the Panama Railroad that the Panama Railroad Company should disregard competition and so fix its rates as would cause it to lose a large part of the competitive business it handles. I take it that on account of the Government owning its stock, aside from endeavoring to set a good example by being fair and just and equal in its treatment of all persons, the Panama Railroad Company should endeavor to handle its business along the same general lines as have proven by long experience to be practical and successful.

The Panama Railroad Company is strengthening its bridges, lengthening its sidings, improving and enlarging its yards at both terminals, adding to its warehouses, increasing the weight and capacity of its locomotive and car equipment, and doing many other things which will enable it to handle freight at a lower cost than at present. As its cost of handling freight decreases, I think, in general, its rates should be reduced so as to leave for the Government only a reasonable return on the investment.

If a flat rate was established it would have to be based on the average rates now obtained, which would mean that the rates on a very considerable quantity of low-grade freight would be increased over what is now charged, while the rates on a considerable quantity of high-grade freight would be reduced. On through traffic, where this company has the water haul by its line of steamers, we could absorb for account of the steamship line the difference between the revenue now secured on this low-grade freight and the flat rate decided upon, but on European business, which during the year 1904 amounted to 168,403 tons, or 52 per cent of our through traffic, the probabilities are that we would stand to lose all of the business that now pays less than the proposed average rate, and statistics show that based on the establishment of a flat rate of \$3 per ton the loss in tons on European traffic would be 41,355 tons, or 24½ per cent of our European traffic.

We would also lose on the better paying traffic the difference between the higher rates now secured and the average or flat rate proposed to be established. This loss in 1904 would have amounted to \$282,108.72, or 37½ per cent of the entire revenue on European traffic, and undoubtedly would have increased to that extent the earnings of our steamship connections on the Atlantic and Pacific.

The following classifications are now in force:

1. New York and Europe to ports on the west coast south of Panama.
2. New York and Europe to Colon, Panama, Central America, and Mexico.
3. Local tariff for local traffic on the Isthmus.
4. Europe to San Francisco.
5. New York to San Francisco.
 - (a) Western classification.
 - (b) Commodities.

6. On east-bound traffic, that is—traffic from ports on the west coast, both north and south of Panama, to Europe and also New York—there is no classification, commodity rates being in force.

NOTE.—These classifications are necessary for the same reason that numerous classifications are in effect in the United States, namely: (1) The necessities of the various countries; (2) the practices of competitive routes.

The complexities growing out of the application of a flat rate where we have so many classifications would be much greater than to use the classifications on percentage divisions. In regard to the expense of billing freight, mentioned by Mr. Wallace, I will give you a letter from Traffic Manager Walker to Mr. Drake, dated February 9, from which you will note that through freight crossing the railroad is all waybilled by the offices of the steamships in Europe, New York, and San Francisco, not one pound is billed on the Isthmus, and the clerical force there is engaged in checking cargo from ships to cars and from cars to ships, which would have to be done irrespective of how the rate of transportation across the Isthmus was arrived at.

The expenses of the railroad are high because of work required in receiving cargo from ships, trucking it into warehouses or cars, acting as a warehouse, transporting cargo according to port calls of connecting steamship lines. By reason of these methods we load cars to one-third or one-half of their capacity, and in trains of less than their capacity, unload the cargo from the cars and again rehandle.

While our haul is short, it costs us just as much to handle the freight out of ships onto cars at one end and out of cars to ships at the other end as if we had a much longer haul. The actual cost of transporting the freight from one terminal to the other is small as compared to the cost of handling at both terminals in the manner we have to handle it in order to deliver it to steamship companies in the order of port calls. The aggregate of these expenses of handling, transportation, and rehandling make the expense so high that, while the canal might operate at a rate of \$2 per ton with profit, the same practice would bankrupt the railroad.

In addition to these expenses there is an annual subsidy of \$250,000 paid by the company, under its contract of concession, which on 390,998 tons carried in 1904 (not including the 23,651 tons of the company's freight) makes an expense of over 64 cents per ton to be considered before the cargo is even touched by the Panama Railroad. In addition to this we have fixed charges of interest and redemption of first-mortgage bonds.

The maintenance of the road will be very heavy, because of its being run down and the necessity of keeping it in ordinary maintenance and repair, to say nothing of new equipment which has to be purchased.

Under Mr. Wallace's theory the railroad would have nothing to do with handling cargo from ship to cars and from cars into ships, but would simply act as a medium of transporting sealed cars from the Atlantic to the Pacific terminus of the road, or vice versa. The trouble with this is that it would practically deliver the handling of our equipment to the various steamship lines, and, inasmuch as there would be so many steamship lines fighting for equipment and the handling of it, we never could get enough equipment on the Isthmus to carry on the business in that way.

Mr. Wallace, in his testimony, suggests a \$2 rate. The statistics for 1904 show that the average cost per ton for handling freight across the Isthmus is as follows:

Ordinary operating expenses.....	\$1.54
Proportion of general expenses.....	.18
Cost of fixed charges.....	.96
Terminal expenses.....	.34
Total.....	3.01

This does not allow for any profit in the operation of the road.

The theory that all freight passing through the canal will pay to the canal a uniform rate is wrong; the tolls to be charged a vessel will naturally be fixed on the principle that prevails at Suez, i. e., the vessel will be charged a rate per ton on her ascertained tonnage capacity of cargo whether she be full of cargo or not; consequently a shipowner after securing part cargo for his vessel and figuring the canal tolls as a fixed charge would accept other cargo at any rate paying more than the cost of handling and risk of damage in order to fill his vessel, and the profit above the cost of loading and discharging will represent the profit in the voyage.

Shortly after becoming connected with the Commission and the Panama Railroad I had the question of making a flat rate across the Isthmus very carefully looked into and gave it considerable thought, the result being that we found in the way of making such flat rate the objections I have just recited.

In connection with the statement made by Mr. Wallace in his testimony before your committee as to the rates on the Isthmus, I will give you copy of a letter written by Mr. Wallace to me, dated May 29, 1905, also a copy of my reply, dated June 8, 1905, confirming cablegram which I sent him on that date authorizing him to adjust the local rates where absolutely necessary and asking that he notify the traffic department at New York of any changes made by him; copy of letter written by me to Mr. Walker, dated June 8, 1905, and copy of his report to me dated June 14, 1905, which bears indorsement by me to Mr. Stevens, dated July 5, 1905, advising him that I had authorized Mr. Walker to put into effect the recommendations made in his letter of June 14, 1905, and indorsement made by Mr. Stevens to me, dated July 11, 1905. I will also give you copies of two letters from Mr. Walker to Mr. Drake, dated February 9, 1906.

T. P. SHONTS.

WASHINGTON, D. C., *February 19, 1906.*

PANAMA, *May 29, 1905.*

Mr. T. P. SHONTS,
*President Panama Railroad Company,
Mills Building, Washington, D. C.*

My DEAR MR. SHONTS: There are a great many minor and trivial matters connected with the adjustment of rates on the Isthmus which need immediate attention. As I presume it will be some time before we can put in an entirely new schedule, I would ask if my authority over the management of the railroad operation on the Isthmus takes with it the authority to make an adjustment in the local tariffs. This, I find, was a custom of General Superintendent Shaler. There has hardly been a day since my arrival on the Isthmus that some emergency has not arisen making it desirable to adjust these rates. The present classified local rates are entirely prohibitive to certain classes and methods of business. For instance, I will cite that the tariff on brick is so high as absolutely to prohibit its shipment across the Isthmus. This applies also to other classes of building material, and has for years seriously retarded the development of Panama.

If you are satisfied to have me take this question up temporarily in such cases as I think may require action, sending the final installation of uniform rates, I will see that as little of it is done as possible and will see that proper notice is furnished the traffic and auditing departments.

If this meets with your approval, will you kindly cable me on receipt of this letter?

Yours truly,

J. F. WALLACE,
Vice-President and General Manager.

PANAMA RAILROAD COMPANY,
New York, June 8, 1905.

Mr. J. F. WALLACE,
Vice-President and General Manager, Colon.

DEAR MR. WALLACE: Referring to yours of May 29 relative to adjustment of minor rates where same are practically prohibitory, I have cabled you as follows:

"Yours 29th relative local rates. Adjust where absolutely necessary."

Please notify the traffic department here of any changes you make so that they may be fully and promptly advised. In the meantime I have written Traffic Manager Walker, as per inclosed letter.

Yours truly,

T. P. SHONTS,
President.

PANAMA RAILROAD COMPANY,
New York, June 8, 1905.

Mr. R. L. WALKER,
Traffic Manager, New York.

DEAR SIR: Herewith I inclose you copy of letter from Vice-President and General Manager Wallace in regard to his making changes in local rates on the Isthmus in

order to overcome unjustified rates of unreasonable inequalities, together with copy of my letter and cablegram to him.

I wish you would go over this whole question of local rates, both passenger and freight, at your earliest convenience and give me your views as to how they should be adjusted in order to be reasonable and fair as between the localities.

Yours, truly,

T. P. SHONTS, *President.*

PANAMA RAILROAD COMPANY,
New York City, June 14, 1905.

Mr. T. P. SHONTS,
President Panama Railroad Company,
Washington, D. C.

DEAR SIR: Referring to your favor of the 8th instant, I beg to report regarding local passenger fares on the Isthmus:

The present tariff went into effect February 1. It is made on the basis of a uniform rate of 5 cents a mile for first-class and 3 cents a mile for second-class passengers, these figures having been reductions from rates varying from 10 cents to 8½ cents per mile, first class, and 5 cents to 4½ cents, second class. The foregoing figures are all United States gold, and considering the change in the comparative value of the silver coinage the comparison between the present rates and the rates in effect prior to February 1 last is as follows:

	At present.		Formerly.	
	First class.	Second class.	First class.	Second class.
Colon to Panama	\$2. 40 gold...	\$2. 85 silver.	\$4 gold.....	\$4. 50 silver.

The bulk of the travel is second class, and I think that 3 cents a mile for the service performed at Panama is not high when compared with the corresponding travel in this country.

I should add that our rates do not include the carriage of baggage, for which the charge is 2 cents a pound when carried in our baggage cars, and it is assumed that passengers will not carry more than 15 pounds hand baggage. The above rate is a reduction from 3 cents a pound.

LOCAL FREIGHT TARIFF.

A complete change in our local tariff was put into effect February 1, the rates varying directly with each 10 miles of the transit. Prior to that time the charges were made the same for every haul on the road without regard to distances. An entire new classification was put into effect.

The rates for 50 miles were fixed at figures which would protect the through rates in operation from New York and from Europe to Panama, but it was expected that the general movement of commercial freight on the Isthmus would be at much lower figures than had prevailed under the old tariff.

Judging by the results of March operations the anticipated reduction is not affected, as shown by the following comparison:

	Tons.	Per ton.	Average.
Colon to Panama:			
1905.....	3, 659	\$14, 474. 50	\$3. 96
1904.....	1, 851	7, 806. 75	4. 22
Panama to Colon:			
1905.....	426	2, 140. 42	5. 02
1904.....	258	1, 872. 66	7. 27

The local tariff should be considered in connection with the through tariff, and I recommend that the through tariff from New York to Panama be reduced from:

First	\$28. 00 to \$22. 50
Second	24. 00 to 12. 75
Third	21. 00 to 11. 25
Fourth	14. 40 to 9. 00
Ten ton lots of fourth-class freight.....	13. 20

In line with this recommendation I think that the local rates for 50 miles should be reduced from the present figures.

CLASSES.

First.....	75 to 50 cents
Second.....	65 to 44 cents
Third.....	50 to 34 cents
Fourth.....	35 to 23 cents
Fifth.....	20 to 20 cents

per 100 pounds, with corresponding reductions for distances varying with each 10 miles.

Touching the matter of bricks, referred to by Mr. Wallace, our rate of 20 cents per 100 pounds, Colon to Panama, is practically the proportion which accrues to us out of the minimum through rate which the European lines were authorized to make from Liverpool to Panama.

The subject recently came to our attention when the agent of the Liverpool Line made a local shipment to Colon, and asked us to make a reduction across the Isthmus, which we did not feel justified in doing because it would have discriminated in his favor against shipments which had gone out from New York. We had offered a shipper a rate of 10 cents a hundred across the Isthmus if he would load and unload the cars after shipping from New York by sailing vessel, but this shipper found it to his interest to go to the expense of putting the bricks in barrels to ship them at our rate of \$5 a ton, New York to Colon, plus \$4 a ton across the Isthmus.

Yours, respectfully,

R. L. WALKER, *Traffic Manager.*

[Written across face of letter:] "Dear Stevens: Pls read. I have authorized Walker to put his recommendation into effect.

"T. P. S.

"7/5.

"Noted. J. P.

"7/11/05."

PANAMA RAILROAD COMPANY, NEW YORK CITY,
February 9, 1906.

Mr. E. A. DRAKE,
Assistant to the President.

DEAR SIR: I return herewith the clipping from to-day's New York Times, which you handed to me this morning, but I am at a loss to account for Mr. Wallace's statement that the rate for bricks across the Isthmus was \$10 a ton. The tariff in effect from July 1, 1892, until February 1, 1905, made the rate on bricks from Colon to any point on the road two-tenths of 1 cent per pound; that is \$4 per ton. The rate from Colon to any point on the road on crockery, during the same period, was \$12 a ton.

The rate for bricks in barrels and casks now varies from 13 cents per 100 pounds for 10 miles to 20 cents per 100 pounds for the length of the road. If shipped loose at the railroad's expense of loading and unloading, our present rates vary from 25 cents per 100 pounds to 44 cents per 100 pounds, following the official classification of the trunk line railroads here.

In this connection I recall that Mr. Wallace wrote to Mr. Shonts from Panama May 29, asking for authority to adjust rates on the Isthmus whenever they needed immediate attention, and stated:

"For one instance, I will cite that the tariff on brick is so high as absolutely to prohibit its shipment across the Isthmus. This applies also to other classes of building material, and has for years seriously retarded the development of Panama."

Mr. Shonts replied by cable June 8: "Yours 29 relative local rates. Adjust where absolutely necessary," and confirmed cable by letter to Mr. Wallace same date.

Yours truly,

R. L. WALKER, *Traffic Manager.*

PANAMA RAILROAD COMPANY,
February 9, 1906.

Mr. E. A. DRAKE,
Assistant to the President.

DEAR SIR: Referring to Mr. Pepperman's memorandum of the 8th instant regarding testimony by Mr. Wallace, particularly as to traffic New York to San Francisco (p. 579), please note that our rates briefly are 30 per cent less than the less carload rates of the transcontinental lines and 20 per cent less than the carload rates, with a minimum of 40 cents per 100 pounds between New York and San Francisco, nearly everything moving under a commodity rate. The inclosed tariff of January 10, 1904, shows the rates at more length.

We use two classifications, following the custom of the transcontinental roads—the western classification and the commodity tariff, the latter covering nearly everything moving.

Statistics show that in 1904 the average revenue per ton to the railroad on freight from New York to San Francisco was \$2.74; for the first nine months of 1905, \$2.93.

Page 583: Through freight crossing the railroad is all waybilled by the steamship offices in Europe, New York, or San Francisco. Not one pound of it is billed on the Isthmus, the clerical force there being engaged only in checking the cargo from ship to cars and from cars to ship. The classification of freight does not involve the outlay of \$1 on the Isthmus. The railroad company receives a percentage of the footings on the steamers' manifests, verified in New York.

I will look over Mr. Wallace's testimony, as requested. Incidentally, I note on page 579 that Mr. Wallace is again confusing the rate of toll for the passage of a steamship through the Suez Canal with the rates of freight. The relation between the two is so remote that they can not be compared, and I repeat what I wrote to Mr. Shonts November 22:

"The theory that all freight passing through the canal will pay to the canal a uniform rate is wrong. The tolls to be charged a vessel will naturally be fixed on the principle that prevails at Suez, a fixed rate per ton on the carrying capacity of the vessel. Each vessel will thus pay a lump sum for passing through the canal, whether she be fully or only partially loaded, whether she be filled with few tons of light cargo or many tons of heavy cargo, and the lump sum paid by the vessel distributed over the cargo laden on board will make a different average rate per ton on a mixed cargo every time the vessel goes through the canal."

Yours, truly,

R. L. WALKER, *Traffic Manager.*

ISTHMIAN CANAL.

COMMITTEE ON INTEROCEANIC CANALS,
UNITED STATES SENATE,
Washington, D. C., Wednesday, March 7, 1906.

The committee met at 2 o'clock p. m.

Present: Senators Millard (chairman), Kittredge, Ankeny, Morgan, Taliaferro, and Simmons.

Present, also, Maj. Gen. George W. Davis, U. S. Army (retired).

STATEMENT OF WILLIAM H. BURR, ESQ.

Senator KITTREDGE. Mr. Burr, will you give your full name to the stenographer?

Mr. BURR. William H. Burr.

Senator KITTREDGE. And what is your age?

Mr. BURR. Fifty-four.

Senator KITTREDGE. Where do you live?

Mr. BURR. In the city of New York.

Senator KITTREDGE. What is your profession?

Mr. BURR. Civil engineer.

Senator KITTREDGE. What is your record from boyhood in that profession? State it to the committee in a general way, please, and with what great enterprises you have been connected.

Mr. BURR. I graduated from the old civil engineering school at Troy, N. Y.; the Rensselaer Polytechnic Institute, in 1872, and I have been in the continuous practice of my profession since that time. During the first ten years of my practice I was engaged chiefly in subordinate positions, as a young man, in iron bridge building and in city waterworks. From 1884 to 1891 I was engaged wholly in iron and steel bridge construction with the Phoenix Bridge Company, with works at Phoenixville, Pa., and with main offices at Philadelphia and New York;—but since 1891 I have lived and carried on the practice of my profession wholly in the city of New York.

I should have stated that from 1875 to 1884 I was a member of the faculty of the institution from which I graduated, in addition to carrying on the active practice of my professional work; and it was at the close of that period that I made my connection with the Phoenix Bridge Company.

In 1892–93 I was professor of engineering at Harvard University. From 1893 to the present time I have occupied the chair of civil engineering in Columbia University. During all this period, however, I have also been actively engaged in the practice of my profession, and continuously from 1892 to the present time I have been connected as a consulting engineer, frequently in charge of work, with

the department of public works of New York City—the department of parks, the department of docks, and the department of bridges. At the present time I am a member of a board of consulting engineers for the board of water supply of that city, which is a board created to construct an additional water supply for the city of New York.

Senator KITTREDGE. Involving the expenditure of how much money?

Mr. BURR. About \$150,000,000, estimated expenditure. I have also, since 1892, been a member of a board of engineers appointed by President Cleveland to consider the feasibility of bridging the Hudson River at New York in one span of about 3,200 feet. I was subsequently appointed also by President Cleveland member of a board to locate and design a deep-water harbor and harbor of refuge on the coast of southern California.

I was a member of the Isthmian Canal Commission of 1899 and 1901, having been appointed by President McKinley.

Senator MORGAN. That was the first Walker Commission, was it—the Isthmian Canal Commission?

Mr. BURR. Yes; it was not the first Commission, however.

Senator MORGAN. It was the second Walker Commission?

Mr. BURR. It was the second Commission of which Admiral Walker was a member.

Senator MORGAN. The second one?

Mr. BURR. The second one; yes. I was also a member of the present Isthmian Canal Commission for a year, until the reorganization of that Commission nearly a year ago.

Senator MORGAN. When did that reorganization take place?

Mr. BURR. The members of the old Commission resigned on the 31st day of March.

Senator MORGAN. And did you resign?

Mr. BURR. I did.

Senator MORGAN. At whose request?

Mr. BURR. At the request of the Secretary of War. It had been understood for a month or more—perhaps two months—that the members of that Commission would present their resignations at any time when it was the desire of the Secretary of War that they should be presented.

Senator KITTREDGE. While a member of the Commission you have just mentioned what were your duties?

Mr. BURR. The duties were of a general character, covering—

Senator KITTREDGE. I refer to the fact, if it be a fact, that you were on the committee in charge of the engineering features of the canal?

Mr. BURR. I was a member of the engineering committee.

Senator KITTREDGE. What other members of the Commission were members of that committee?

Mr. BURR. Mr. Parsons and Mr. Grunsky, as I remember. I think that is correct. Is it not, General Davis?

General DAVIS. And the governor of the Canal Zone ex officio.

Mr. BURR. And the governor of the Canal Zone when that committee was present on the Isthmus.

Senator MORGAN. What committee is that?

Senator KITTREDGE. It was a committee of the Commission.

Senator MORGAN. The executive committee?

Senator KITTREDGE. The engineering committee, as I understand it. Is that right?

Mr. BURR. Yes, sir.

Senator MORGAN. The engineering committee of the Commission?

Mr. BURR. Yes. Perhaps I should explain that the Commission was divided, for purposes of administration and performing the work, into five committees, if I remember right, and the engineering committee was one. Those committees were expected, in rotation, to be upon the Isthmus, so that practically four members of the Commission would be almost continuously on the Isthmus, the governor of the Zone being a member of each committee as it visited the Isthmus.

Senator MORGAN. Was the governor of the Zone a member of the engineering committee?

Mr. BURR. When that committee was on the Isthmus he was a member of that committee.

Senator KITTREDGE. And the governor at that time was General Davis?

Mr. BURR. The governor at that time was General Davis.

Senator KITTREDGE. And afterwards, what has been your connection with the Panama Canal enterprise?

Mr. BURR. Since the reorganization of the Commission I have been a member of the Board of Consulting Engineers, which recently made its report.

Senator KITTREDGE. You were one of the members of the board that signed a report in favor of the construction of a sea-level canal?

Mr. BURR. I was.

Senator MORGAN. You are not now a Commissioner?

Mr. BURR. I have not been a Commissioner, Senator, for nearly a year.

Senator KITTREDGE. Are you familiar with the report that a minority of the Consulting Board of Engineers made, favoring the construction of a lock canal?

Mr. BURR. I am.

Senator KITTREDGE. Have you read the testimony of Mr. Stevens, at the present time the chief engineer of the canal?

Mr. BURR. I have read very nearly all his testimony. Before to-morrow I shall have read all of his testimony.

Senator KITTREDGE. Now, Mr. Burr, will you please tell us the reasons for the conclusion you reach, and the objections and criticisms, if any, you make upon the report made by the minority of the consulting engineers, as well as of the testimony of Mr. Stevens? You may state it in your own way, if you please.

Senator MORGAN. First state which report you agreed to sign.

Senator KITTREDGE. He has stated that, Senator.

Mr. BURR. I signed the report of the majority, favoring and recommending the construction of a sea-level canal.

That will necessitate my covering considerable ground, and I will be glad if any member of the committee will interrupt me at any time and ask any questions, because, as the matter presents itself to my mind, it may not be illuminating to those who listen. I shall first—

Senator MORGAN. Before you proceed to state that, let me ask this question: You concurred in the report as it was presented to the President?

Mr. BURR. The report of the majority.

Senator MORGAN. I say, the report that you signed?

Mr. BURR. I did—oh, yes; I concurred fully.

Senator MORGAN. Were all the reasons set out in that report that you think are material to support it?

Mr. BURR. Those are all the main reasons.

Senator MORGAN. I suggest, then, that inasmuch as that report is here and in writing, and everybody has seen it, and all that, Mr. Burr should address his attention to such additional matters as may be useful, in his opinion, to sustain that report; or, if he has changed his mind, such additional matter as may account for that change.

Senator KITTREDGE. I think, Senator, that perhaps it might be better to have him state in his own way the reasons for his conclusion.

Senator MORGAN. That was what I was trying to get at—whether he had already stated them in his own way in signing that report.

Mr. BURR. I concur entirely in that report.

Senator MORGAN. Yes.

Mr. BURR. Wholly so; and I am as strongly in favor of a sea-level canal at the present time as I ever have been. The more I reflect upon it, the more it seems to me that that plan is the one which the United States Government should adopt.

I am willing to proceed in any way the committee desires.

Senator MORGAN. It is a mere suggestion of mine. I do not suppose you want to rehearse all of the matters that are contained in the report of the majority which you signed. I did not suppose you did. They are all here, and written out in very admirable style, very exactly and very fully and completely, I suppose; but it occurred to me that after allowing Mr. Burr to say, as he has done, that that report represents his views on the subject, he should proceed to state any other reasons that he may choose to advance for the support of that report.

Senator KITTREDGE. I think, Senator, that he should be permitted, at least for a time, to state his conclusions in his own way; and I ask that it be done, unless there is objection.

Senator MORGAN. I will repeat that I assumed that he did state it in his own way when he signed that report. But go ahead; I will make no further suggestion about it.

Mr. BURR. My conclusion as to the type of the canal which should be adopted for the ship waterway across the Isthmus has been based on about six and a half years of continuous study and observation, largely on the ground. In the work of the first Isthmian Canal Commission, where it was the duty of that Commission to determine the most practicable and feasible route for a ship canal, it was the unanimous opinion of that Commission that for its purposes a lock canal should be recommended, and it was recommended. That recommendation was largely for the tentative purpose of making a comparison between the Nicaragua and the Panama routes. In order to make a proper comparison, a comparison which might be considered fair and reasonable, it was necessary to make it upon the basis of a lock plan for each, because it would not be practicable or feasible in any sense of the word to construct a sea-level canal on the Nicaragua route.

There were, however, members of the first Isthmian Canal Commission, including Mr. Morison, now dead, and myself, who were somewhat surprised to find, by such approximate estimates as we were then able to make, that the sea-level plan came so near being feasible. It was a subject of remark between Mr. Morison and myself on more occasions than one. But with the information then available and for the purposes of that Commission, a lock canal only was considered feasible, and all members of the Commission united in that expression, myself among them.

When, however, the present Commission was created, further investigations were made, very extensive investigations, which it was not practicable for the first Commission to undertake or to complete, in the progress of which it became clear to my mind at least that a sea-level canal was entirely feasible and practicable; that many of the objections which had been supposed to exist, insuperable objections, largely or entirely disappeared.

Senator MORGAN. Objections coming from whom?

Mr. BURR. Not from individuals, but objections based upon the physical conditions and the feasibility of doing the work required in the construction of the sea-level canal.

Senator MORGAN. They were objections, then, that were considered by the Commission?

Mr. BURR. Objections that were considered by the Commission, and which had been frequently mentioned by others.

Senator MORGAN. And stated in their report?

Mr. BURR. Partially stated in the report, and stated by others outside of the Commission who had discussed the general problem. For instance, the control of the Chagres in case of a sea-level canal was one of the great objections; and there were others of that nature.

Senator MORGAN. But the Commission considered objections to a sea-level route at that time when they went down there to make the investigation?

Mr. BURR. They considered objections to a sea-level route.

Senator MORGAN. That was when you were investigating the comparative merits of the two canals?

Mr. BURR. Yes; under the first Isthmian Canal Commission.

Senator MORGAN. Under the first Commission?

Mr. BURR. Yes.

Senator MORGAN. Were not those objections stated by the Commission in their report?

Mr. BURR. Not all of them, I think; some were—for instance, the period of time which it was supposed it would take. That time, however, I should say, in justice to myself, I never concurred in. The periods of construction which were assigned to the Panama and the Nicaragua routes were decided by a five-to-four vote, five voting that a period of twelve years should be assigned to the construction of the recommended lock plan on the Panama route and ten years for the construction of a lock canal on the Nicaragua route. I opposed that. I never believed that that length of time should be assigned for the construction of the Panama route, and I have never changed my judgment on that point.

Senator MORGAN. You thought it was too short?

Mr. BURR. I thought it was too long.

Senator MORGAN. On the Panama route?

Mr. BURR. Yes. I thought that twelve years for the construction of the Panama Canal as then proposed was too long; that it could be done in a shorter time.

Senator MORGAN. That was a lock canal?

Mr. BURR. That was a lock canal.

Senator MORGAN. How about the sea-level canal?

Mr. BURR. I believed that the time mentioned in that report—from fifteen to twenty years, if I recall it rightly—was too long.

Senator MORGAN. How much too long?

Mr. BURR. I believed so at that time.

Senator MORGAN. How much too long?

Mr. BURR. I was not at that time able to state how much too long, because our investigations were not sufficiently extended to enable a reasonable estimate of time to be made.

Senator MORGAN. But you all went far enough in your investigations to satisfy yourselves that you could make a report to the President that the sea-level canal was not practicable within the meaning of the act of Congress?

Mr. BURR. At that time and for the purposes of that Commission.

Senator MORGAN. Well, practically within the meaning of the act of Congress?

Mr. BURR. I should be entirely willing to subscribe to that form of answer, Senator, if it is to be understood that the meaning of the act of Congress had for its purpose the comparison of the two routes, but not as an absolute verdict as to the two types of canal.

Senator MORGAN. In other words, you did not consider yourself committed by signing that report—joining in it—to the proposition that a sea-level canal at Panama was impracticable?

Mr. BURR. Not necessarily. I felt—and I am sure at least one other member of the Commission also felt—that our investigations were not sufficiently extended; it was not possible at that time to extend them sufficiently to settle that question finally.

Senator KITTREDGE. Who was the other member of the Commission?

Mr. BURR. I refer to Mr. Morison.

Senator KITTREDGE. When did he die?

Mr. BURR. He has been dead about a year and a half.

Senator MORGAN. Did he write any on the subject before he went away?

Mr. BURR. Oh, yes; he wrote a good deal.

Senator MORGAN. On the practicability of a sea-level canal?

Mr. BURR. No; not on the practicability of the sea-level canal, but on the canal question in general.

Senator MORGAN. Oh, I know that; I have those writings; but I did not remember that he had ever passed his judgment in writing upon the practicability of a sea-level canal.

Mr. BURR. I do not think he did, sir.

Senator MORGAN. No; I think not. When did you first arrive at the conclusion that a sea-level canal was practicable?

Mr. BURR. I first arrived fully at that conclusion about a year ago—a little more than a year ago.

Senator KITTREDGE. You may proceed in your own way, Mr. Burr.

Mr. BURR. That conclusion was reached after our experimental

work and our engineering investigations in general, as carried out by the Isthmian Canal Commission as then constituted. We had made many surveys and investigations during the preceding months. We had operated experimentally a number of steam shovels and old French excavators under very disadvantageous and uneconomical conditions, which showed that the excavation could be made at materially less cost than was theretofore anticipated, and that a greater rate of progress could be made. So that a maturer study of the greatly extended information secured convinced me that a sea-level canal was entirely practicable and feasible.

Senator MORGAN. Before that time had you been convinced of that?

Mr. BURR. I had not been convinced until the additional information and data which I have described were available.

Senator SIMMONS. Was that before you were appointed on the Board of Consulting Engineers?

Mr. BURR. That was before; yes.

Senator MORGAN. Is the sea-level canal that you speak of and have in mind of the Bunau-Varilla type—the "straits" through there?

Mr. BURR. No, Senator. I think that is an ideal ultimate attainment, but not at all necessary for the greatest volume of traffic that will be needed, perhaps, for half a century or more, and not within the meaning of the law under which we were acting.

Senator MORGAN. We could accommodate the law to that if we had the money, could we not?

Mr. BURR. We could, I suppose.

Senator MORGAN. And if we wanted to take the risk. The plan, then, which you had in your mind, and to which you gave your full adherence a year ago, or about that time, was not a sea-level canal; it was a canal with a lock?

Mr. BURR. That is a sea-level canal, Senator.

Senator MORGAN. If it requires a lock wherein is it a sea-level canal?

Mr. BURR. Because the elevation of the water surface in the canal would be at mean sea level.

Senator MORGAN. But there would still be an elevation of the water to mean sea level?

Mr. BURR. I do not quite understand your question, sir.

Senator MORGAN. If I understood you, you said that the elevation of the water in the canal would be at mean sea level.

Mr. BURR. Yes; the water surface in a sea-level canal would be at mean sea level.

Senator MORGAN. It would require some lifting, would it not, to get it up from the actual sea level to the mean sea level?

Mr. BURR. It would in some stages of the tide, and it would require dropping down at others.

Senator MORGAN. Exactly; 20 feet oscillation between the points?

Mr. BURR. It would be 10 feet lift at extreme high tide, or 10½, and 10½ feet fall at extreme low tide.

Senator MORGAN. That is 20 feet?

Mr. BURR. Twenty-one.

Senator MORGAN. Twenty-one feet?

Mr. BURR. Yes.

Senator MORGAN. Then it would require a lock there, and lock gates, to get the water into the canal and out of the canal?

Mr. BURR. It probably would; but I am not at all certain that it may not be entirely feasible to enter and leave that canal without a tidal lock at the Panama end of the canal. But even if it should require such a lock, its gates would be wide open at least half the time.

Senator MORGAN. Well, "half the time" is a loss of half the time, is it not? If the gates are open half the time, it is a loss of half the time—the other half—is it not?

Mr. BURR. During the other half of the time the lock would be used.

Senator MORGAN. It would have to be used?

Mr. BURR. Yes.

Senator MORGAN. So the loss would be the time that would be necessary in getting in and out of it?

Mr. BURR. Yes; but it would be a sea-level canal even with that lock.

Senator MORGAN. It does not strike a man that knows nothing about engineering that it could be a sea-level canal if the water was compelled to be lifted 10 feet and let down 10 feet in order to get an actual level.

Mr. BURR. At extreme tides.

Senator MORGAN. At extreme tides. They come once a day, at least, do they not?

Mr. BURR. No; not such extreme tides—oh, no! They are only the extreme spring tides. They occur every lunar month.

Senator MORGAN. In the intervals between the spring tides, what is the average rise and fall of the tide there?

Mr. BURR. The mean range of tide, I think, is 13 or 14 feet. I think the mean range is about 14 feet.

Senator MORGAN. Yes.

Mr. BURR. The range at neap tides, the low tides, is, if I recollect right, about 7 or 8 feet only.

Senator MORGAN. Yes.

range of 21 feet, are very rare. They do not occur even every lunar month, but—

Senator MORGAN. Both at a neap tide and at a spring tide, your view, as I understand it, is that locks and gates—lock gates—would be necessary?

Mr. BURR. At spring tides they would probably be necessary; but I say that it is not clear in my mind yet, I am not satisfied, that the entrance of the canal at the Panama end, where these high tides are found, can not be so devised as to do away with the lock. But in the absence of a demonstration we must assume that a tidal lock would be necessary, and we have so assumed it.

Senator MORGAN. Therefore you put a tidal lock into your estimate of the cost?

Mr. BURR. Yes.

Senator MORGAN. No matter what might be the effect?

Mr. BURR. Yes; we did.

Senator MORGAN. That is what I wanted to find out.

Senator KITTREDGE. Is that all for the present, Senator?

Senator MORGAN. That is all that I wish to ask him.

Senator KITTREDGE. Will you please now proceed, Mr. Burr?

Mr. BURR. One of the great objections to a sea-level canal, or one of the greatest alleged objections to a sea-level canal, heretofore, has been the assumed impracticability of controlling the floods of the Chagres River. The average rainfall on the Isthmus is about 130 inches—125 or 130 inches—on the Caribbean side.

Senator MORGAN. Per annum?

Mr. BURR. Per annum; and, approximately speaking, about half that on the Pacific side of the Isthmus. The watershed of the Chagres River lies on the Caribbean side, so that it receives this greater rainfall. Above Bohio the watershed of the Chagres River has been variously estimated at 700 to 800 square miles. The doubt as to the exact area arises from the fact that no complete surveys of that watershed have ever been made.

It is, therefore, not a large river. It is a small river. But the downfalls of rain are sometimes at such a high rate, and the watershed, the higher part of the watershed above Gamboa particularly, is such as to induce a very quick run-off; and that produces rapid rises or quick floods, reaching sometimes—it is supposed 70,000 to 80,000 cubic feet per second at Gamboa, or possibly 110,000 or 112,000 cubic feet per second at Bohio.

Senator MORGAN. Please give the measurements in feet.

Mr. BURR. The measurements of rise in the river?

Senator MORGAN. Yes.

Mr. BURR. I do not recall those accurately, Senator; but the highest flood, I think, means about 38 feet rise at Bohio, and about 32 feet at Gamboa. Those figures are not far out of the way.

Senator MORGAN. Those rises are sudden, are they not?

Mr. BURR. Those rises are sudden.

Senator MORGAN. And sometimes follow each other in rapid succession, with a few days' interval?

Mr. BURR. There has been a record of no more than two or possibly three (I think only two) successive rises; but it is a juncture which must be provided for.

Senator MORGAN. One of those records you speak of ran up to 45 or 47 feet, did it not?

Mr. BURR. I think not as high as that, Senator. I think that there is no rise higher than 38 feet at Bohio, although I am speaking from memory and may be mistaken to a slight extent.

Senator MORGAN. It is not very material anyway, I think. That is to be taken into account, as I understand you, in determining the question of the control of the waters of the Chagres River?

Mr. BURR. It has been found feasible to control those floods with absolute certainty, with as much certainty as ever attends the construction of any engineering work.

Senator MORGAN. You say "found feasible?"

Mr. BURR. Yes.

Senator MORGAN. By practical experiment?

Mr. BURR. No; by actual surveys and computations, the usual methods.

Senator MORGAN. After all, that is in a sense conjectural, is it not?

Mr. BURR. Oh, I think not, Senator. Enough works have already been constructed of precisely the same character as those which would be required for that purpose to, I think, demonstrate with certainty that they may be made there.

Senator MORGAN. But have they been in precisely such a country with respect to the rainfall, or with respect to the precipitation—I mean the sharpness of the elevation.

Mr. BURR. We have much greater rises in this country, Senator, than the rises in the Chagres River.

Senator MORGAN. In this country?

Mr. BURR. Yes.

Senator MORGAN. Have we any greater rainfall than comes there within a few weeks or a few days?

Mr. BURR. No; we probably have not as heavy rainfall, but we have rivers with much greater watersheds, so that the range between high and low water is almost double that of the Chagres.

Senator MORGAN. But the time of rising and falling is longer?

Mr. BURR. It is longer; yes.

Senator MORGAN. That has to be accounted for, has it not?

Mr. BURR. Not in the controlling works. That is, the rapidity of rise does not affect the difficulties of construction of the controlling works. We do not care how rapidly it rises, so far as they are concerned—that is, so far as their safety and their construction are concerned. It is only the maximum height which has to be provided for.

Senator SIMMONS. Mr. Burr, have you stated yet what length of time it took generally for these high rises?

Mr. BURR. No; I have not stated; but you may get on the Isthmus one of the highest of the freshets within about thirty-six hours—from thirty-six to forty-eight. Usually it is a little longer than that from the beginning of the flood, but you may say that the maximum flood may be attained in from thirty-six to forty-eight hours. But they are also of short duration, as might be expected in such a quick stream.

Senator MORGAN. Mr. Burr, in your conclusion as to the controllability of the waters of the Chagres, where would you put your controlling works?

Mr. BURR. I should put the controlling works at Gamboa. A dam would be built across the Chagres River at that point of sufficient height to raise the surface water in the lake to about 175 feet above sea level, or about 125 feet above the bed of the river at that point.

Senator MORGAN. The fall being 50 feet from there to sea level?

Mr. BURR. About 50 feet. The bed rock is found there at about sea level—that is, about 50 feet below the bed of the river, which is within easy reach of construction. It is an admirable place for a dam, and it is a wonder that the French company was so easily discouraged from building at that point.

Senator MORGAN. What is the character of the rock, if you please?

Mr. BURR. The rock, like all the rock in that country, is of volcanic origin.

Senator MORGAN. Basalt?

Mr. BURR. I do not think that at that point there is any basalt, although there is some not far from that. The hard rock at Gamboa is a peculiar rock, different from anything that we have here, and I do not know that I am enough of a geologist to describe it properly; but it is a hard, gritty rock.

Senator MORGAN. Tough?

Mr. BURR. Tough; most of it is. It has, of course, some soft portions.

Senator MORGAN. With dikes coming up through it?

Mr. BURR. No; not at that point.

Senator MORGAN. There are no dikes in the foundation rock at Gamboa?

Mr. BURR. No dikes; but it would undoubtedly be found of irregular quality, like all the rock in that vicinity.

Senator MORGAN. I understand.

Mr. BURR. The basalt dikes, strictly speaking, are about nine miles from there, near Pedro Miguel. There is columnar basalt there.

Senator MORGAN. You say you would put your controlling works at Gamboa; how would you take care of the waters that come in through the affluents of the Chagres River below Gamboa, between that point and Port Limon?

Mr. BURR. Those are all comparatively small, with the exception of the Gatun River, which now empties into the Chagres River at the little native village of Gatun. The discharge of that river would be carried to a part of the bay back of Colon called Puerto Escondido.

Senator MORGAN. You mean to the east of Colon?

Mr. BURR. To the east of Colon. That channel is largely constructed at the present time. It was partially completed by the old French Company. By that means the waters of the Gatun River, or Gatuncillo, as it is sometimes called, would be taken to the ocean without going into the canal at all. They would be kept out of it entirely.

Senator MORGAN. How about the other streams? I do not care about going into the particulars about it; I simply want to know how you take care of all of those streams.

Senator KITTREDGE. Senator, would you just as soon permit Mr. Burr to point to the map?

Senator MORGAN. Oh, I have no objection; of course not.

Mr. BURR. This partially completed channel is shown as running from Gatun, entirely easterly of the canal line, over into Puerto Escondido, which is at this point [indicating], Colon being here; so that the waters of the Gatun River will be carried to the sea without going into the canal at all. They will be entirely kept out.

Senator MORGAN. That would be done, I suppose, by constructing a dam near the canal?

Mr. BURR. There would be necessary a couple of small dams near Gatun so as to make a continuous channel for the river without running into the Chagres, as it does now.

Senator MORGAN. You would not turn the current of the Gatun River back upon itself, but you would divert it to this point you speak of?

Mr. BURR. I would divert it to the ocean in that way.

Senator MORGAN. Yes; divert it by means of a dam.

Mr. BURR. There are two or three of the small streams (what you may call the larger of the smaller streams, because they are all small) which run into the Chagres from the west, that is, from the left-hand side of the canal as we look at it from here—which would be turned back upon themselves, so to speak, by relatively small dams, so as to be turned back into other watersheds, and so carried down to the ocean also without going into the canal at all.

Senator MORGAN. They would pass over the crest of their watersheds into the sea on the other side?

Mr. BURR. Yes; they would not run directly into the sea, but into streams which run into the sea.

Senator MORGAN. I understand.

Mr. BURR. The still smaller streams—and there are quite a number of them, but all very small—would be taken directly into the volume of the canal in the ordinary way, quite an ordinary procedure in canal construction; but instead of pouring directly into the prism of the canal they would first pass through a basin built on one side of the canal prism, so that any sediment which they might bring down in floods would be held there and the water would flow over a weir into the canal. In that way no sediment whatever from the Chagres River or from any of its contributory streams would be brought into the canal. It would be entirely kept out, and it would also be kept out of the canal on the Pacific side from the small streams—because there are only small streams on that side—in a precisely similar way.

Senator MORGAN. So that the water would find its way into the canal, but the sediment would be left behind in these basins?

Mr. BURR. The sediment would be left behind in these basins.

Senator MORGAN. It would come in as clear water?

Mr. BURR. It would come in as practically clear water.

Senator MORGAN. But it would all go into the canal?

Mr. BURR. It would all go into the canal. The great Gamboa Lake would, of course, contain all the sediment of the Chagres above the Gamboa dam.

Senator MORGAN. That would be a good deal, would it not?

Mr. BURR. I think it would be a good deal. There is some doubt about the measurements that were made by the first Isthmian Canal Commission, of which I was a member, as to the amount of sediment which comes down the river past Alhajuela; but there would be considerable sediment.

Senator MORGAN. How would you dispose of that to prevent it filling up the basin?

Mr. BURR. It would take a very long period of years to fill up that great lake.

Senator MORGAN. Well, we expect to live a long time, you know—that is, this Government does.

Mr. BURR. Well, I suppose that after a century or a hundred and fifty or two hundred years some measures would perhaps have to be taken.

Mr. BURR. Dredging would relieve it. It would be very easy to pump it out onto the land, or even over a low divide, by hydraulic methods, such as are used at the present time, for a few cents a yard.

Senator MORGAN. Do you take that into your computation of the cost of the sea-level canal?

Mr. BURR. No; that is too far in the future, Senator.

Senator MORGAN. Too remote?

Mr. BURR. Too remote.

Senator MORGAN. Do you take in your computation the amount of water that you have to deal with, I will say, that comes from these affluents of the Chagres River below Gamboa into the channel of the canal?

Mr. BURR. We do. We take into account all the water that would be brought into the prism of the canal.

Senator MORGAN. As it all comes in, is it your opinion that in the highest flood waters that occur on the eastern or northern side of that Caribbean range of mountains there might not be a disturbance in the navigation of the canal?

Mr. BURR. No, sir; there is not enough to make any disturbance in the canal.

Senator MORGAN. Not enough to make any currents?

Mr. BURR. Not currents that would disturb navigation at all. There might be maximum currents of perhaps a mile and a half to a mile and three-quarters, possibly two miles an hour, at most, on some rare occasion. I should have stated, in speaking of these great floods, that they come rarely. There have been only five in about the last fifty years.

Senator MORGAN. A great steamer navigating that canal from the Bay of Limon, we will say, going south, or wherever it is—it is south—and encountering such floods as this in that part of the canal below Gamboa, would have to make some provision for resisting them, would it not?

Mr. BURR. No, sir; it would steam right through without any disturbance whatever.

Senator MORGAN. You think a current of a mile and a half an hour in the canal would not affect its navigation?

Mr. BURR. Not at all, nor considerably more than that. A current of 2 miles an hour would not disturb it.

Senator MORGAN. It would not disturb the navigation? It would be as safe in a mile-and-a-half current as it would in dead water?

Mr. BURR. Practically so. It has been found so in other canals. The Suez Canal sometimes has materially greater currents than that, and they have not been found to give any material inconvenience to navigation; and I think fully as great currents as that are found in the Manchester Canal. You know those are not matters of speculation or of opinion. They are simply matters of observation of such canals as the Suez and the Manchester.

Senator MORGAN. How would it be on the southern side of the canal when you were navigating a steamship 800 feet long and with a displacement of 15,000 tons or 20,000 tons, going toward Panama, if, in addition to the water coming from a flood in the Chagres, there should be also a spring tide meeting you, going out toward Panama? Would not that create a current?

Mr. BURR. That raises the question of the necessity or not of the locks in the extreme spring tides. Of course if the tidal lock were present, the influence of the extreme tides would be kept out of the canal.

Senator MORGAN. At sea level there would be practically solid rock on both sides of this canal for a distance of 10 or 12 miles, would there not?

Mr. BURR. Do you mean through the summit divide?

Senator MORGAN. Between Emperador and Culebra Heights.

Mr. BURR. Yes; there would be solid rock on both sides.

Senator MORGAN. Solid rock on both sides?

Mr. BURR. Yes.

Senator MORGAN. And some curvatures to pass?

Mr. BURR. Yes; some curvature; very easy curvature.

Senator MORGAN. Emphasis seems to be laid by some of the engineers upon the proposition that navigation through that part of the canal would be perilous, or would require very great caution, even under normal conditions of water supply; and that opinion seems to be intensified in respect to the situation that would be created by the incoming of waters from the Pacific or the outgoing of waters from the Pacific in combination with a flood in the Chagres.

Mr. BURR. The waters from the Chagres floods would only be permitted to enter the canal by the controlling works at such a rate as would not make a current of over a mile and a quarter an hour at most.

Senator MORGAN. But that current might go either way.

Mr. BURR. If the current goes both ways, if it were equally divided and should go both ways, it would be only half that.

Senator MORGAN. Yes.

Mr. BURR. So that even if it all goes one way, even if it went toward the Pacific, which is scarcely conceivable, there would be no current—experience shows that—which would be materially inconvenient to navigation.

Senator MORGAN. You say experience shows it. I suppose you have some model or plan which looks exactly like this?

Mr. BURR. No; we have more conclusive evidence than would be shown by a model. We have the evidence of the navigation of the Suez Canal, where the curvature is not so very different from that which would exist in the sea-level canal, and with a much narrower prism.

Senator MORGAN. It has not any rock walls on the sides of it, has it?

Mr. BURR. It makes no difference what the character of the banks are, if you have a sufficient cross section of water. The width of this canal between the solid rock banks would be 200 feet, and the actual width of the Suez Canal at the present time, even on the curves, is only 131 feet, and the width at the turning-out places, the passing places, is only 147½ feet. So that the width of the sea-level prism proposed is wider throughout the whole length of this proposed canal than even the passing places on the Suez Canal at the present time.

Senator MORGAN. Does your plan or your idea of a sea-level canal include turning-out places?

Mr. BURR. The whole canal is a turning-out place.

Senator MORGAN. Not for two big ships?

Mr. BURR. Two big ships could pass each other anywhere; but if it is desired to have more free passing places, turn-outs can be constructed anywhere at very small cost. But, as a matter of fact, with the actual experience of the Suez Canal before us, the whole canal is really a passing place, and all ordinary ships would pass each other anywhere.

Senator MORGAN. But what about extraordinary ones?

Mr. BURR. Extraordinary ships could pass anywhere in this 200-foot section, even the largest ships. It would only be in the Caribbean and Pacific ends where it would be necessary to provide even

a little additional width for passing places for the greatest ships that are now projected.

Senator MORGAN. Creating turn-outs, if they became necessary, in this great wall of rock cut of 10 or 12 miles—I do not know exactly the distance; nobody knows how long it would be—would be expensive; would it not?

Mr. BURR. Pardon me, Senator—in that portion where we have rock walls there would be no turn-outs, because the width there is 200 feet, and that would pass any ships which are now projected—not actually afloat, but which are projected.

Senator MORGAN. Would it not be extremely unsafe for two great steamers to undertake to pass each other in a channel not wider than 200 feet?

Mr. BURR. They would not attempt to pass each other at speed. One would tie up.

Senator MORGAN. Ah! Now we have it. Then it is necessary to tie up one ship until the other passes?

Mr. BURR. Yes.

Senator MORGAN. That is in your plan?

Mr. BURR. Yes; precisely as is done in the Suez Canal at the present time.

Senator MORGAN. That is at the expense of considerable loss of time, is it not?

Mr. BURR. Not much; very little—very little. In fact, it does not seem to me that the actual difference in time of passing a canal of either type on the Isthmus is anything of material consequence one way or the other. I believe that the sea-level canal would pass any ship quicker than a lock canal; but I do not think the difference in time is of much importance.

Senator MORGAN. Does your plan imply that the vessels will pass through the canal with their own steam and their own propellers, without the assistance of tugs?

Mr. BURR. Yes; they do that in the Suez Canal, which has a materially smaller prism.

Senator MORGAN. It is not an uncommon thing for vessels to get ashore in the Suez Canal, is it?

Mr. BURR. Yes; it is an uncommon thing, but they do it at times.

Senator MORGAN. Yes; they do it.

Senator SIMMONS. Mr. Burr, what would be the difference between the summit level of the Gamboa Lake and the sea-level canal?

Mr. BURR. The sea-level canal would be at sea level, and the highest surface of water in the Gamboa Lake would be about 170 feet above it.

Senator SIMMONS. Above it?

Mr. BURR. Yes.

Senator SIMMONS. How would you get that escape water into the canal?

Mr. BURR. That comes through regular controlling sluices in the dam, and then is carried down in a specially constructed masonry conduit with steps and other forms which are commonly used by engineers in such cases, so that when it reaches the level of the water in the canal—not in the canal, but in the basin on one side of it—its velocity is practically destroyed; so that it flows over a long weir

from that basin quietly into the canal. There is no cascade into the canal.

Senator SIMMONS. Where it enters the sea-level canal, the summit would be about how much above the level of the sea-level canal?

Mr. BURR. Practically the same thing; just enough to make it flow over a weir.

Senator SIMMONS. How far would the dam of that lake be located from the prism of the canal?

Mr. BURR. It is about a half a mile; about that. I have forgotten the exact distance, but it is practically half a mile.

Senator SIMMONS. By gradual steps you would let the water down that distance of half a mile to the level of the canal?

Mr. BURR. Yes; it would come down with its current baffled, as we say, by these various constructions, so that when it enters the canal it is a quiet sheet of water flowing over a weir.

Senator MORGAN. You put the sluices in the dam, do you?

Mr. BURR. In the dam.

Senator MORGAN. On the same principle as the dam at Assouan?

Mr. BURR. Very much the same.

Senator MORGAN. There are doors that can be lifted?

Mr. BURR. Yes.

Senator MORGAN. Do you consider that a safe method of handling the water?

Mr. BURR. It has been found so by prolonged experience. That is not a matter of conjecture. There are many such controlling methods constantly in use, and have been for years.

Senator MORGAN. There is no danger of obstruction from floating timbers, or anything of the kind?

Mr. BURR. Oh, there may be occasionally a small obstacle in working a gate, just as all devices are occasionally open to a little derangement; but nothing to give any material trouble.

Senator MORGAN. These sluice gates would pass directly through the cross section of the dam, would they?

Mr. BURR. In this case they would be put at the westerly end of the dam—about at the end of my pencil. The dam itself would be right across the Chagres River.

Senator SIMMONS. Mr. Burr, I understood you to say that you would go about 50 feet below the present land surface to get the foundation for that dam?

Mr. BURR. To bed rock.

Senator SIMMONS. Yes; to bed rock. Now, how high did you say that dam would be, starting at this foundation?

Mr. BURR. It would be a little under 200 feet in total height from its top to the bed rock. The surface of water in the lake would be about 170 feet above bed rock.

Senator SIMMONS. What would be the length of that dam?

Mr. BURR. The length of the dam is about 2,200 feet, if I remember right.

Senator SIMMONS. And what is its width at its base and at its summit?

Mr. BURR. The width at the base and at the summit would depend upon whether it is built as a masonry dam, or whether as an earth dam with a masonry core.

Senator SIMMONS. Which do you recommend?

Mr. BURR. I would favor an earth dam with a masonry core; but a concrete dam, all masonry, would be, perhaps, equally good. I say that I would favor an earth dam with a masonry core simply because a large amount of the waste of the Culebra cut could be deposited there very conveniently; but the estimate of the majority of the board covers the cost of that dam abundantly, whether it be made of concrete or of earth with a masonry core.

Senator MORGAN. Do you remember that estimate, in round numbers?

Mr. BURR. I think about \$6,000,000.

Senator SIMMONS. What would be the width at the bottom in that case?

Mr. BURR. In that case the width of the masonry core would be 50 feet.

Senator SIMMONS. At the bottom?

Mr. BURR. As we designed it for our estimates. The width of the great earth bank in which it is embedded would be as much as you please to make it. We estimated that it would be at least 2,000 feet, perhaps half a mile. Of course that is much more than is necessary for stability; but so long as the spoil must be deposited somewhere it could be deposited there so as to make this dam a part of the earth's surface, a great mountain across the valley.

Senator SIMMONS. Two thousand feet wide at the base?

Mr. BURR. Two thousand feet wide at the base, and at the top—I have forgotten, but I think it was possibly 200 feet. It might be more; with the waste that would have to go in somewhere, in fact, it would probably be ten or twelve hundred feet.

Senator SIMMONS. How high would that dam be above the mean level of the lake?

Mr. BURR. That would depend upon how low the surface would be drawn down. If it were to be drawn down 30 feet, or I will say 35 feet—I am speaking from memory—if it should be drawn down 35 feet that oscillation in the lake's surface would more than take care of two successive floods the greatest of which we have any record at the present time.

Senator SIMMONS. How high would it be? How much would it be above what you estimate would probably be the highest level of the lake?

Mr. BURR. I do not know that I quite catch your question, Senator; but let me put it in this way—that the highest water surface in the lake—

Senator SIMMONS. That is what I mean.

Mr. BURR. The highest water surface in the lake would be about 170 feet above mean sea level, and mean sea level, of course, would be the elevation of water surface in the canal. In other words, it would be about 170 feet above the surface of the water in the canal.

Senator MORGAN. When you speak of taking care of two successive floods, the largest that have occurred, do you mean without resort to the sluice gates?

Mr. BURR. There is volume enough to take two successive floods.

Senator MORGAN. Without running anything off through the sluice gates?

Mr. BURR. Without running anything off through the sluice gates.

Senator MORGAN. The length of those sluice gates, of course, would correspond with the width of the dam, which might be, you say, even half a mile?

Mr. BURR. No; pardon me. The sluice gates would not be as long as the dam. The sluice gates would occupy the western end of the dam.

Senator MORGAN. On the western side of the dam?

Mr. BURR. Yes; where there is rock in the hills, so that the gates themselves would be founded right in the rock, which reaches up nearly to the top of the dam at that end.

Senator MORGAN. Yes.

Mr. BURR. So that the overflow through those sluice gates could never imperil the stability of the earth part of the dam. You see, they are so far on one side and running down through natural rock and masonry channels that the safety of the earth part of the dam would be absolutely assured.

Senator MORGAN. So that there would be no sluice gates at all except through this extension of the dam, which is made for that purpose?

Mr. BURR. That is it, precisely.

Senator MORGAN. And a sluiceway dug out in this bed of rocks?

Mr. BURR. In the rocks.

Senator MORGAN. Out of the hills?

Mr. BURR. Yes.

Senator KITTREDGE. Is the foundation of the Gamboa dam the same, no matter which kind of dam is to be constructed?

Mr. BURR. It would be the same—that is, you would go down to bed rock in either case.

Senator KITTREDGE. Of what material would the foundation be constructed?

Mr. BURR. If it were of masonry it would be concrete only, because that is the most economical, and absolutely durable.

Senator SIMMONS. Mr. Burr, would not that dam cost very nearly if not quite as much as the large dam at Gatun that is proposed in connection with the lock-canal plan?

Mr. BURR. Very nearly, as the estimates are made; but at the proper time I shall do as I did in the board itself—criticise that design, and state why, in my judgment, it is not a proper construction for such an important work. If it were put into the condition which, in my judgment, the importance of the work demands, it would cost much more than it is estimated to cost.

Senator SIMMONS. And would that amount be much greater than the estimated cost of the dam at Gamboa?

Mr. BURR. It would be materially more; I can not state just how much.

Senator SIMMONS. According to the estimates of cost made by the engineers who recommended the lock canal, it would not be much greater than your estimate of the cost of the dam at Gamboa?

Mr. BURR. I will give you just the exact estimates, Senator, in one moment, if you will pardon me. The estimate of cost of the Gamboa

dam in the sea-level plan is \$6,000,000. The estimate for the Gamboa dam and spillway—that is a part of the dam, of course, just as much as the sluice gates of the other dam are—is \$7,788,000.

Senator MORGAN. A million and a half more at Gatun than Gamboa?

Mr. BURR. A million and three-quarters.

Senator TALIAFERRO. And you will contend that, properly constructed, that cost is underestimated?

Mr. BURR. That will be my criticism.

Senator SIMMONS. Can you give me, in that connection, the estimated cost of the dam that is to be constructed on the Pacific side—the large dam in connection with the other lock? I do not know what that other lock is called. What is it called?

Mr. BURR. Sosa lock, I think it is.

Senator SIMMONS. Sosa lock—yes.

Senator KITTREDGE. You mean the three dams?

Senator SIMMONS. Yes—well, all except the one that provides for the oscillation of the tides.

Mr. BURR. There are two dams, you know, Senator, on the Pacific end. There are two dams there. There is a hill called “Sosa Hill” right in the line of those two dams, and one dam is on one side of it and the other on the other.

Senator MORGAN. They are connected with an embankment?

Mr. BURR. Well, yes. The hill right in the low ground, called Sosa Hill, is connected by a dam with Ancon Hill on one side, and with the hill on the other side of the Rio Grande estuary also by a dam.

Senator KITTREDGE. Is there not a third dam, Mr. Burr, from Ancon Hill over toward the railroad?

Mr. BURR. There is a dyke there, yes; you may call it a dam. That is correct. It is not so high as the others. The La Boca dam—that is, the dam to the westerly of Sosa Hill—is estimated to cost \$1,675,000, and the Ancon-Sosa and Ancon-Corozal—that is the one which you have in mind—amounts to \$1,645,000 more. The total is \$3,320,000; and in my judgment the same criticism would be made, only stronger, if anything, against the sufficiency of those dams as against the sufficiency of the Gatun dam. But that is a matter which I will take up further on.

Senator KITTREDGE. Mr. Burr, is there not another dam and lock at Miraflores?

Mr. BURR. Not at Miraflores. There are approach walls to the Pedro Miguel lock which play almost the part of dams; but they are not called a dam. They are a part of the lock works.

Senator KITTREDGE. Have you the cost of the construction of them?

Mr. BURR. Of the Pedro Miguel locks?

Senator KITTREDGE. Yes; of the approaches to the Pedro Miguel locks.

Mr. BURR. The Pedro Miguel locks, including excavation and back filling, \$6,988,000, and approach walls, \$300,000, or about seven and a quarter millions—chiefly for the locks.

Senator KITTREDGE. That is at Pedro Miguel?

Mr. BURR. Yes.

Senator MORGAN. That corresponds, then, to the dam at Gatun?

Mr. BURR. Yes.

Senator MORGAN. Where is the additional cost of the Gatun dam project over the sea-level project as to dams on the Pacific side?

Mr. BURR. I do not know that I understand your point, Senator.

Senator MORGAN. There is a certain cost of constructing the dams on the sea-level plan on the Pacific side, the Panama side. There is first an estimated cost of constructing the Gatun dam.

Mr. BURR. Pardon me; there is no dam on either the Panama or the Colon end in the sea-level plan.

Senator MORGAN. Well, I call it a dam. I am speaking about the approaches into the ocean on either side.

Mr. BURR. Oh, do you mean the approach channel?

Senator MORGAN. Yes; the approach channel.

Mr. BURR. Those are costly works, because on the Panama end there is a large amount of rock excavation in those channels.

Senator MORGAN. And in addition to that there are the lock gates?

Mr. BURR. The lock, the tidal lock, which is also an expensive feature, costing, as I remember, about six millions, or estimated to cost about six millions; but I will give you that in a moment. Six millions is allowed for the twin tidal locks at the Panama end of the canal in the sea-level plan.

Senator MORGAN. Then when you get a ship through the twin locks it is in the Bay of Panama?

Mr. BURR. It is in the Bay of Panama.

Senator MORGAN. What cost is there for constructing the channel from that point out to those three islands there, which are the anchorage of the incoming ships?

Mr. BURR. From the end of the lock to deep water the estimated cost is \$6,196,000.

Senator MORGAN. Now we will turn over to the other side.

Mr. BURR. That is largely due to the rock excavation.

Senator MORGAN. Now we will turn over to the other side. What is the cost—

Senator KITTREDGE. May I ask a question before you put that?

Senator MORGAN. I would like to complete that question. It is a question consisting of two propositions.

Senator KITTREDGE. That is all right.

Senator MORGAN. The cost of making a ship channel in the Bay of Limon, as estimated by the minority of that Commission, and also of a breakwater, is that estimated for?

Mr. BURR. Yes; the breakwater.

Senator MORGAN. In the Bay of Limon?

Mr. BURR. It is practically the same. The sea-level estimate is \$5,000,000; the lock estimate, \$5,300,000. That is for the breakwaters. The channel in Limon Bay is \$624,400 in the sea-level plan and \$1,245,000 in the lock plan.

Senator MORGAN. Yes.

Mr. BURR. It is much wider.

Senator MORGAN. I merely wanted to get those figures associated together, so that they would be easy of comparison, you know. I want to get this proposition that we are discussing simplified, if we can do it, down to the question of the actual work of cutting the channel of the canal.

Senator KITTREDGE. The question that I wished to ask Mr. Burr is if there is any material difference in the work in Panama Bay for one type of canal as compared with the other?

Mr. BURR. No; not in Panama Bay.

Senator KITTREDGE. It is just the same?

Mr. BURR. It is just the same.

Senator SIMMONS. Mr. Burr, you said a little while ago, as I understood you, that you disposed of the waters of the Gatun River by building a dam and providing a drain way, you say. You would have to do that, would you not?

Mr. BURR. Yes; we would have to complete that diversion channel, which is now partially dug.

Senator SIMMONS. You said there were some other small streams which flow naturally into the Chagres, which you would dam up and throw the waters back on themselves for the purpose of preventing sediment flowing into the prism of the canal.

Mr. BURR. Yes.

Senator SIMMONS. Could you tell what would be the cost of the construction of that dam and drain way to dispose of the waters of the Gatun River, and the cost of the dams of these other streams that would have to be dammed under the sea-level plan, but not under the lock plan?

Mr. BURR. About three and a half millions.

Senator MORGAN. That includes the Gatun River?

Mr. BURR. That includes the completion of the river diversions, the formation of dams across tributary streams, the regulation of the rivers which flow into the canal, etc.

Senator MORGAN. Now, except the Gatun River, all of those rivers which you would have to take care of there with these dams come in from the west?

Mr. BURR. They nearly all come in from the west.

Senator MORGAN. The Gatun River is the only one you would have to control?

Mr. BURR. Yes; the Gatun River is by far the largest. The most of those streams are very small. In fact, when I have been on the Isthmus in the dry season some of them were practically or absolutely dry—essentially so.

Senator SIMMONS. Now, Mr. Burr, summarizing, what would be the total difference as to the cost of constructing dams and drainways to dispose of the waters of these streams between the lock-canal plan and the sea-level canal plan? I am speaking merely now of dams and drainways to control these waters.

Mr. BURR. The total cost under the sea-level plan would be the three and a half millions which I have just mentioned, added to the six millions for the Gamboa dam, which would make nine and a half millions, to which the usual 20 per cent has been added. That is the total cost of all those works for the sea-level plan.

Senator SIMMONS. Both dams and otherwise?

Mr. BURR. Yes. In the lock plan there is no corresponding item, because all the rivers there flow into the lakes unobstructedly.

Senator SIMMONS. So that in the lock plan you only have the dams at Gatun and La Boca there?

Mr. BURR. Yes.

Senator SIMMONS. Those three over there?

Mr. BURR. Yes; those three over there and the Gatun dam.

Senator SIMMONS. Not the Gatun Lake; you mean the La Boca Lake?

Mr. BURR. I mean there are three dams on the Pacific side; those three smaller dams and the one Gatun dam on the Caribbean Sea.

Senator SIMMONS. And the Gatun dam, in connection with the lock-canal plan?

Mr. BURR. Yes.

Senator SIMMONS. And their cost is—

Mr. BURR. Their cost is \$3,320,000.

Senator KITTREDGE. That makes seven million and something.

Mr. BURR. Yes; and then there are diversion channels—four and a half millions added to \$7,800,000—say about twelve and a quarter millions.

Senator KITTREDGE. I do not quite understand that. Probably I am in error. The dam at Gatun costs seven million and a half?

Mr. BURR. About \$7,800,000.

Senator KITTREDGE. Yes. Then the three dams at La Boca and Sosa Hill—

Mr. BURR. And the diversion channels.

Senator KITTREDGE. And the diversion channels cost how much?

Mr. BURR. About four and a half millions more.

Senator KITTREDGE. Yes; I understand.

Mr. BURR. And to that sum would be added the usual 20 per cent.

Senator TALIAFERRO. What comparison are you making now, Mr. Burr?

Mr. BURR. I was simply answering the question as to the cost of these particular works; that is all.

The CHAIRMAN. I would suggest that it would be a good deal more expeditious if we let Mr. Burr go on and make a general statement of this thing, and then take up the questions afterwards.

Senator MORGAN. I think we are making very good progress.

Senator SIMMONS. The objection to that, to my mind, is that we lose the questions and lose the pertinency of them.

The CHAIRMAN. Of course you know that we will have all of that evidence that Mr. Burr gives us to-day before us in the morning; and I suppose you will be with us to-morrow, anyway, Mr. Burr. I simply thought it would expedite matters a little; that was all.

Senator MORGAN. I think every question that has been asked has been material.

The CHAIRMAN. I think so; I have no doubt of that, Senator; but I was thinking whether we could not proceed a little faster; that was all.

Senator KITTREDGE. You may proceed, I think, Mr. Burr.

Mr. BURR. The other feature of the construction of the sea-level canal which has been considered of great difficulty is that of the excavation through the summit cut. The total length of the canal between 42-foot contours is about 49 miles. Of that distance about 25 miles, perhaps 18 on the Caribbean side and 7 on the Pacific side is through a territory the surface of which is but little above sea level, so that the canal throughout those portions would naturally be a sea-level waterway.

The remaining 24 miles, or about 24 miles, approximately, from Bohio to Miraflores, is of a different character. It embraces the high ground along the canal line, the highest of which is at Culebra, the summit of the Cordillera at that location. That summit originally was about 330 feet above sea level. It has now been cut down about 160 or 165 feet. The bulk of this excavation, involving the greatest difficulty and requiring the most time, is located along about 8 miles of this distance, from Obispo, near Gamboa, to Pedro Miguel. The total volume of excavation within that distance is about 110,000,000 cubic yards.

The surface is clay, and it is in that surface clay where the difficulty of slipping or sliding has been encountered, although that difficulty has been much exaggerated. When clay is wet it will slip, whether it is in this country or on the Isthmus. That feature of this work does not seem to me to be so formidable as it does to many, because from my student days in Troy down to the present time I have seen a great deal of wet clay. I have seen it slip. I have been brought in contact with it many times.

The vicinity of Troy, N. Y., is one of clay hills. There have been many slips there, one of which occurred in my student days on the line of the New York Central road, between Troy and Schenectady, in a cut, as I recall it, between 40 and 50 feet deep. The bank slipped on one side of that cut and filled in, so that railroad traffic was interrupted for perhaps ten days. There have been numerous slips within the limits of the city of Troy on the steep hills about there, all due to water getting into the clay. All that is necessary to remedy such a condition is simply to excavate the clay or to drain it and keep the water out; and that is all that is necessary in the great Culebra cut.

It is not a new problem. It is no formidable feature of the work. It has simply to be treated down on the Isthmus precisely as it is treated here. There would be no slipping of the clay in the vicinity of the Culebra cut if it is drained, as it may be, or if portions of it, where it may readily be treated in that way, are excavated. It is not a material difficulty; it is not an obstacle to the construction of a sea-level canal. It simply means drainage and excavation; that is all. I might say that I speak, perhaps, with undue emphasis on this point, because I have been over every foot of that ground myself, and in view of my previous experience with slipping clay, which I have just stated, I speak not from hearsay or opinion, but from actual observation extending over many years.

Below this surface of clay there is found the characteristic rock and indurated clay of the Culebra cut. The upper part, or nearly all of the upper part, of the cutting below this surface clay is a peculiar indurated clay, within which, however, are found veins or strata of hard basaltic rock; not a clear basalt, but hard rock of a basaltic nature—very hard rock. All of this material, whether the indurated clay or the hard rock, must be blasted, the softer part of it requiring but small charges of black powder, others being hard enough to require dynamite; but it is a material which presents no special difficulty in excavation. It has simply to be attacked like any other rock excavation, soft rock or hard rock, as the case may be.

Senator ANKENY. What do you mean by indurated clay? What is it stated to be in the books?

Mr. BURR. It is called indurated clay in the books. It is a peculiar material.

Senator ANKENY. Is it a clay at all?

Mr. BURR. Yes; it is a clayey material, but it shades off into the surface clay that I have already spoken of on the one side and down into hard rock on the other. It is difficult for one who has been accustomed to seeing only the materials here in this country to realize what irregular and unusual stuff you may find on the Isthmus. I know it impressed me in that way.

Senator ANKENY. I did not mean to interrupt you.

Senator MORGAN. This clay is supposed to be disintegrated rock, is it not?

Mr. BURR. It is supposed to be, and undoubtedly it is. Much of this hard or indurated material which I speak of, all of it so hard as to require blasting, will go to pieces if you put a lump of it in a glass of water; it will go to pieces within a few seconds.

Senator MORGAN. It dissolves, like sugar or salt or something of that kind?

Mr. BURR. No; it does not dissolve. It simply goes to pieces and falls down into fine material; and yet you may sink a pit in that material, and the pit will fill with water and stay there apparently indefinitely.

Senator ANKENY. Will it deliquesce, or gather moisture?

Mr. BURR. No, sir; it does not. I have been down in those pits myself that have had water in them for months, and the sides—

Senator ANKENY. I mean will it absorb moisture in a damp climate, so that it would fall away, as camphor does, for instance?

Mr. BURR. No, sir; it weathers a very little, but not much. These banks have stood up there for six years, within my personal experience, and the weathering has been very little; very little, indeed; surprisingly little.

The excavation of this cut, which has been regarded with so much apprehension, I might almost say with dread, and which still appears to be regarded in that way in some quarters, seems to me to be without any of those awe-inspiring features. It is a plain case of digging. The only unusual feature about it is its size; that is all, absolutely. There is nothing else about it that is out of the ordinary. It is simply an enormous piece of excavation. You can, as we of the consulting board have done, lay out a system of attacking that cut, much as it was laid out by the New Panama Canal Company, with a programme to be carried out with as much certainty as ever can be attached to any great engineering work. In fact, it is very seldom that a great engineering work offers so clear and unobstructed a programme for execution as the taking out of the material in that cut.

The particular part of the cut which each shovel will excavate, and from which tracks or to which tracks must be led can be set forth with mathematical precision; so that the actual progress of the work can be conclusively demonstrated. If you put a steam shovel against a face of material of this kind, and put steam on it, it will work; and if you have tracks leading up to it, and locomotives with cars on them, you can certainly get the material away at a rate which can be estimated. It is perfectly practicable. It does not seem to me

that the simplest procedures within the range of engineering construction involve such great uncertainty. In fact, in my judgment, they involve no uncertainty at all. We know that during the rainy season there will be some interruption to work, although I am satisfied that that interruption is not nearly so great as many suppose it will be, for I have been on the Isthmus during the rainy season as well as the dry season. I have been there when it rained heavily.

The CHAIRMAN. Mr. Burr, just for my own satisfaction, I want to ask you this: When we were on the way to Panama you told me the amount of rainfall that was had at Greytown. To satisfy my curiosity on that point, I want you to state what that is.

Mr. BURR. About 25 feet, Senator.

The CHAIRMAN. In a year?

Mr. BURR. Yes, sir. Fortunately, we have not that to contend with on the Isthmus.

The CHAIRMAN. It was so much that I was very much surprised, I know.

Mr. BURR. That is not every year, but it is not phenomenal.

The CHAIRMAN. Proceed. Excuse me for interrupting you.

Mr. BURR. It seems to me, therefore, that if there is any one part of this work which is freed from the usual uncertainties of engineering construction it is this plain, simple matter of digging this great mass. And I want to say, right at this point, that that is not any new impression of mine. It is precisely the impression that I had when I was on the Isthmus between five and six years ago, and which prompted me to argue obstinately for the assignment of a shorter period of construction for the Panama Canal than for the Nicaragua.

My mind was absolutely open in going there, but I have been forced by the results of my observation to these conclusions. So that, when you lay out the detailed plan of attack for the excavation in the Culebra cut and make all allowances for rainy weather and for inefficiency of labor, which is great on the Isthmus, for the liabilities to breakdowns of steam shovels or for any other material delays, and allow an ample margin for exigencies which can not be anticipated, I believe there is nothing more certain in estimating the rate of progress of any great work than the time which the majority assigned for the completion of this summit excavation.

I have not the slightest doubt that that entire excavation can be completed within ten years. When I make that statement I appreciate fully its gravity and what it means. I have been face to face with the situation on the ground many times. I have watched the excavation many times. I have endeavored to realize all the uncertainties which are usually assigned to it, but, as an engineer who has had some experience with large works, I can not see where these dreadful difficulties exist that are supposed to attend the excavation of this great cut. I think that the lions which are so often seen in the way—which have been seen and are still seen—are due to its magnitude only.

It is a work which requires patience first, and patience last, and patience all the while between; but all it needs is that persistence which, constantly exerted, will accomplish any work on schedule

time. It is easily feasible to drain the work so that the water falling upon it in the heaviest rains will run off quickly. The work in no case need then be delayed more than a few hours, except possibly in the case of an occasional slip, which will occur rarely.

We have heard a good deal about the rains rendering the tracks unusable. As a matter of fact the tracks of the Panama Railroad have been there for fifty years, and I do not know that the total delay from wetting those tracks and washing them away is enough to be assigned. Bridges have been carried away occasionally, of course; but it is perfectly feasible, within the range of any competent engineer's capacity, to construct those surface tracks that lead up to the shovels in such a way that there will be no sensible break in their operation due to the rainfall. It will require a little more substantial construction of tracks than those which ordinarily lead to a railroad excavation while it is in progress of construction, but that is not material.

The ballasting will have to be done with a little more care, and drainage will have to be completed in a perfect system leading to every elevation of track throughout the whole cutting; but that is perfectly feasible. A considerable number of those tracks and of considerable length will be permanent. They will be used throughout the entire work. Those would be ballasted like any railroad track. All those matters are feasible; they are simple matters of everyday construction with an engineer.

Senator ANKENY. That applies to all of your laterals, does it?

Mr. BURR. Yes. It applies to all laterals, and there would be tracks on the different terraces very near where the final slopes would exist that would be used for years for carrying away this material. Those tracks would be ballasted in a permanent way, like any railroad track. The additional cost is not much.

The whole rational question resolves itself simply into making a proper preparation for this work. That is all there is of it. There is nothing extraordinary, nothing unusual; but it does require great patience and persistence—that is, you have got to do a great deal of work over a period of perhaps two or three years that does not appear to bring any adequate return, but it will bring its return. In fact, it will bring about the completion of the excavation.

As stated in the report, it is practically a matter of demonstration that that material can be excavated from the summit within the period of ten years. If we add to that 25 per cent additional time, after making all the other allowances which have been made, as the board did, giving a period of from twelve to thirteen years, it is an outside limit of the time for the completion of the canal. I believe that it can be done and will be done.

Senator ANKENY. With either type?

Mr. BURR. In less time.

Senator ANKENY. With either type of canal—lock or sea-level?

Mr. BURR. I am speaking now of the sea-level plan. The lock plan I shall refer to to-morrow, assuming that we will not get to it to-day. It is a somewhat different proposition, but not altogether so.

Senator ANKENY. I did not mean to interrupt.

Mr. BURR. I am speaking now of this great Culebra cut, which has been such a bugbear to so many people. Its whole significance lies

in its size, that is all. It is not a complicated thing. It is a matter of transportation. The digging is a very simple matter. Transporting the material away is the essence of the whole problem, and the manner of attack which I have spoken of and which has been laid out with so much detail and so much care, is devised with a view to solving the transportation problem, not the problem of digging, because that takes care of itself.

Senator MORGAN. You cut through the Culebra Heights in benches?

Mr. BURR. Yes, sir.

Senator MORGAN. About what is the height of each bench?

Mr. BURR. Twenty-five or 30 feet. In the plan which I laid out for myself particularly I took them at 30 feet. In the scheme which Mr. Wallace laid out he took them at 25.

Senator MORGAN. What is the width of those benches?

Mr. BURR. Twenty-five feet.

Senator MORGAN. Twenty-five feet high and 25 feet wide?

Mr. BURR. I took the benches at 30 feet high and 25 feet wide. Mr. Wallace took them just the other way. But it does not make any essential difference. I took them at 25 feet wide because that is just the width required for the double track, which will allow the steam shovel on one track to be served by cars on the other; but 30 feet may be taken, so far as that matter is concerned.

Senator MORGAN. While you are running along with the cars on a bench 30 feet high, or 25 feet high, your shovels would work below?

Mr. BURR. No; the shovel will be at work on the same level.

Senator MORGAN. But it will work below and lift the material up to the cars, would it not?

Mr. BURR. No; the cars serving the steam shovel would be on the same level as the steam shovel itself.

Senator MORGAN. And work right against the wall?

Mr. BURR. Work right alongside of the steam shovel.

Senator MORGAN. Yes; on that line?

Mr. BURR. Yes, sir.

Senator MORGAN. When you get through with that you would go down and open another line?

Mr. BURR. Another steam shovel would do that after the upper one had gone far enough on to be out of its way.

Senator MORGAN. And you could keep up the work continuously if you had shovels enough?

Mr. BURR. Yes, sir; so that we could work at least 100 shovels. That can be demonstrated beyond any doubt whatever. But from 80 to 100 shovels is all that is necessary to accomplish this purpose.

Senator MORGAN. Why could you not carry the Panama Railroad on one of those benches through that divide?

Mr. BURR. It could be carried there eventually; but you would not want it running through the cut while the work was going on, because it would be in the way, that is all.

Senator MORGAN. Would it necessarily be in the way?

Mr. BURR. Yes; of course while you are at work on the cut you do not want anything more in there than you have to have.

Senator MORGAN. The difficulty I am trying to get rid of is one that has embarrassed me all the time, and I have not found anybody yet that could explain it fully. When this canal is completed,

whether it is a sea-level or a lock canal, that railroad has got to be changed from its present location, because it now crosses the canal twice.

Mr. BURR. Yes.

Senator MORGAN. Therefore, to prevent the crossing of the river but once, which would be at Gamboa, it must go up on the right bank of the Chagres, straight up to Gamboa, and from that out by Obispo, and from that out through, as I contend, the Culebra Heights. My proposition, or suggestion, rather, is that that railroad can be conducted or located there permanently and conducted on one of those benches so as to save winding around that hill and crossing this canal.

Mr. BURR. It can be. There is no question about that?

Senator MORGAN. It can be done now?

Mr. BURR. Only that it would be in the way of the work going on; that is all. But it could stay where it is until the canal is finished, and then you could change it.

Senator MORGAN. You think it would not do to finish it in that manner when you had got down below it, as you would be away down below it?

Mr. BURR. Yes; you can change it then if you desire to.

Senator MORGAN. Selecting a bench that is out of the way?

Mr. BURR. Yes, sir.

Senator MORGAN. And putting the railroad right through that cut, and keeping it on the right bank of the Chagres River all the way up until you crossed it at Gamboa?

Mr. BURR. That is feasible.

Senator MORGAN. That is the point I wanted to get at and to get on the record. That applies, I think, to both forms of canal?

Mr. BURR. I can not see that it makes any difference whether it is one type or the other.

Senator MORGAN. With a lake created by a dam at Gatun, you could not go anywhere else except on the right bank of the Chagres?

Mr. BURR. You would have, of course, to relocate the railroad. There would be no help for that.

Senator MORGAN. The whole length of it, down to Gatun?

Mr. BURR. Yes.

Senator MORGAN. That is what I thought.

Senator KITTREDGE. Within what time can the Culebra cut, in your judgment, be excavated?

Mr. BURR. Within ten years.

Senator MORGAN. Forty feet below sea level?

Mr. BURR. Yes, sir.

Senator KITTREDGE. Beginning at what time?

Mr. BURR. I mean ten years from the actual beginning of work.

Senator KITTREDGE. Can all the other works necessary to construct and complete a sea-level canal be completed within that ten years?

Mr. BURR. They can, easily.

Senator KITTREDGE. In other words, the time employed in the excavation of the Culebra cut is the maximum time for the completion of a sea-level canal: is that it?

Mr. BURR. That is the controlling feature, so to speak; yes.

Senator KITTREDGE. Under the type and plans proposed by the Board of Consulting Engineers—in other words, a sea-level canal—

is there involved any untried, unusual, or doubtful engineering proposition?

Mr. BURR. I know of none.

Senator KITTREDGE. And you make us that statement upon the years of experience you have mentioned?

Mr. BURR. I do.

Senator MORGAN. I wanted to ask you in that connection where you would put your dump in making a sea-level canal?

Mr. BURR. That is an open question. I think, now, that it would be a judicious disposition of that spoil to fill up all the marsh land, beginning at about Miraflores and extending to the mouth of the Rio Grande estuary. There are a considerable number of square miles of territory which at present is waste, and never can be anything else, in its present condition, but which could be filled and made valuable land by the spoil from the Culebra cut. It may be that it would be found advisable to carry some of it to sea and dump it. While I should not wish to commit myself absolutely to any plan of disposition at this moment, that is a perfectly feasible and reasonable plan.

Senator MORGAN. Can you take the spoil from Obispo, for instance, and carry it now to those flats out at the mouth of the Rio Grande?

Mr. BURR. I would, unless there was some convenient disposition for that at Obispo in the other direction. North of Obispo the amount of excavation is relatively small.

Senator MORGAN. Yes

Mr. BURR. That is, much less than the bulk of it in the other direction.

Senator SIMMONS. What will be the relative length of time required for the passage of a ship through a sea-level and a lock canal?

Mr. BURR. That will depend on the size of the ship. It is generally accepted and is confirmed by experience that if the area of wet cross-section of a canal prism is four times that of the immersed cross-section of a ship, the ship may pass through that canal at a speed of not less than 6 miles per hour. The section proposed in the sea-level plan fulfills that condition for all the great ships, or practically all now completed. It would not quite apply to the 800-foot steamships which are now being built or understood to be being built for the Cunard Line; but very near it. It even very nearly meets that condition for that size of ships. But I think that there is no ship now projected or likely to be built within the near future which could not pass through the canal at a speed of 4 to 5 miles per hour.

Senator SIMMONS. You are speaking of a sea-level canal?

Mr. BURR. I am speaking of the sea-level prism as proposed. But if it were the case of a battle ship, when it was urgent for the United States Government, for instance, to pass a fleet from one side to the other, I do not doubt that those ships would go through the prism as proposed from 6 to 8 miles per hour—that is, they would put them through at that speed. Of course if that were kept up day after day, eventually there would be perhaps a washing of the banks at some parts; but to meet an emergency, there would be no objection to such a procedure.

The most of the ships, however, which would go through that canal, the great bulk of them, up to sizes exceeding any ships that are now engaged in the South American trade, or even in the oriental trade,

whether it is a sea-level or a lock canal, that railroad has got to be changed from its present location, because it now crosses the canal twice.

Mr. BURR. Yes.

Senator MORGAN. Therefore, to prevent the crossing of the river but once, which would be at Gamboa, it must go up on the right bank of the Chagres, straight up to Gamboa, and from that out by Obispo, and from that out through, as I contend, the Culebra Heights. My proposition, or suggestion, rather, is that that railroad can be conducted or located there permanently and conducted on one of those benches so as to save winding around that hill and crossing this canal.

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Senator KITTREDGE. In other words, the time employed in the excavation of the Culebra cut is the maximum time for the completion of a sea-level canal: is that it?

Mr. BURR. That is the controlling feature, so to speak; yes.

Senator KITTREDGE. Under the type and plans proposed by the Board of Consulting Engineers—in other words, a sea-level canal—

Senator MORGAN. You would run your dredges in those channels and get the water from the Chagres River or wherever you found it, necessary to float them?

BURR. Yes. It is Chagres water entirely.

Senator MORGAN. And when you came to the bed of the Chagres you would keep right along in the bed of the river, dredging out, on up toward Bohio?

Mr. BURR. I would.

Senator MORGAN. Would it be necessary to divert the Chagres River in order to work those dredges successfully?

Mr. BURR. Not at all.

Senator MORGAN. You would expect to take the river course, if it was coincident with the canal line, and work right on as if the river was not there?

Mr. BURR. Yes, sir.

Senator MORGAN. Preferring that it should be there?

Mr. BURR. Yes, sir; it is an advantage to have it there.

Senator MORGAN. I say, preferring that it should be there?

Mr. BURR. Yes, sir.

Senator MORGAN. The dump from those dredges, I suppose, would be disposed of in these marshy places there?

Mr. BURR. It would be disposed of in those marshes.

Senator MORGAN. And in these dumps did you propose to divert these smaller streams?

Mr. BURR. A little of it would be used there; but it would take a very small volume to do that; and the probability is that not much of the excavation from the canal prism would be used for such a purpose. It would be practically all waste. That near Colon would be used to fill up the town of Colon.

Senator MORGAN. Then, you would not find it necessary, if I understand it—and I think that is a very important inquiry—you would not find it necessary to build the dam at Gamboa until you had dredged up to the vicinity of Obispo?

Mr. BURR. I would not wait for that. The dam at Gamboa should be commenced at once.

Senator MORGAN. Very good; but you would not find any necessity for it in the matter of conducting the work until you had dredged up to the vicinity of Obispo?

Mr. BURR. It would not be necessary, but there would be advantages in building it at the earliest practicable date.

Senator MORGAN. What would they be?

Mr. BURR. In the first place, it would give you power.

Senator MORGAN. Oh.

Mr. BURR. And the quicker you complete that dam the sooner you will control the floods of the Chagres; and it would be better to have a uniform, moderate flow of the Chagres River when you are at work along it than to have the floods.

Senator MORGAN. In the matter of construction of the dam, both to the south of Gamboa and to the north of it, you would use the water of the Chagres River for floating the dredges, and you would use the railway from the heights there to haul your dump in, and you would want to put your dam there the first thing you did, or the core of it, and cover it in with this dump?

Mr. BURR. Yes, sir.

would go through that canal at a speed of 6 to 8 miles an hour; and small ships, of course, at a greater speed.

Senator SIMMONS. Mr. Burr, you only spoke about the length of time it would require a ship to pass through the sea-level canal. Will you now please explain as to the lock canal?

Mr. BURR. The time required to pass through the lock canal is a matter of estimation. It is maintained by the minority that the largest ships could pass through the lock canal quicker than through the sea-level canal; but they admit that that would not be the case with the smaller ships, or possibly the bulk of vessels which would go through the canal. I doubt the accuracy of that estimate myself; and I doubt it for reasons which I shall give in detail when we get to that type of canal. With either type of canal, however, a ship can get through quickly enough for any demand of commerce. It has always seemed to me that any small difference—and the difference is only small—between the time of passage with either one type or another, is of entirely secondary importance, whether a ship goes through an hour quicker than another or not, except, possibly, in the case of a fleet in time of emergency.

Senator SIMMONS. You mean to say, then, taking into consideration the loss of time at the locks, that the difference in time required would not be very great?

Mr. BURR. It would not be very great. I believe, as a broad statement, that the ships would go through the sea-level canal more quickly than they would through the lock canal, but the difference would be small and of no special consequence.

Senator MORGAN. Mr. Burr, the two plans as laid down or described in the reports here start the canal, whether it be a sea-level canal or a lock canal, in the Bay of Limon, not at Colon.

Mr. BURR. The Board was unanimous, I think, that the best entrance is to go straight in from the Bay of Limon, instead of going around that curved entrance, although that curved entrance leads to an inner harbor of great value and would always be used as a harbor.

Senator MORGAN. I understand that. That is not to be thrown away. One is to be for the accommodation of commerce and for the Panama country and the other for the canal purposes exclusively.

In digging the sea-level canal between Gamboa and the Bay of Limon you would enter toward the east and would work toward the south?

Mr. BURR. Yes.

Senator MORGAN. And you would expect to do a large part of that with dredges?

Mr. BURR. Yes, sir; it could be attacked at various points.

Senator MORGAN. I know it could be, but the dredging work would be the cheapest?

Mr. BURR. Yes, sir. But I mean you could attack it at various points with dredges, even. You would not be limited to one end to work in.

Senator MORGAN. You mean you would use the waters of the Chagres River for floating the dredges?

Mr. BURR. Yes; and the partially completed canal. There is about 13 or 14 miles of partially completed canal.

Senator MORGAN. That reaches up to Bohio, does it not?

Mr. BURR. Practically to Bohio—not quite.

Senator MORGAN. You would run your dredges in those channels and get the water from the Chagres River or wherever you found it, necessary to float them?

Mr. BURR. Yes. It is Chagres water entirely.

Senator MORGAN. And when you came to the bed of the Chagres River you would keep right along in the bed of the river, dredging that out, on up toward Bohio?

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Senator MORGAN. In the matter of construction of the dam, both to the south of Gamboa and to the north of it, you would use the water of the Chagres River for floating the dredges, and you would use the railway from the heights there to haul your dump in, and you would want to put your dam there the first thing you did, or the core of it, and cover it in with this dump?

Mr. BURR. Yes, sir.

Senator MORGAN. Is that the method you have in mind?

Mr. BURR. That would be a very natural procedure, but there are many advantages in having that dam built as quickly as it is feasible to build it.

Senator MORGAN. So that would be one of the first works to be started?

Mr. BURR. Yes, sir; or should be.

Senator MORGAN. And when you got it so that it would hold water and all that you would commence dumping into it?

Mr. BURR. I would. In fact, I should not wait until then. I should commence dumping just as soon as the state of the masonry core wall, if it is built that way, would permit.

Senator MORGAN. And the spoil would come from the direction of Culebra?

Mr. BURR. The spoil would come from that direction. I must necessarily speak of this conditionally, because the chief engineer might find that he could get material close by, not from the canal prism, which he could dump into this dam to make its mass cheaper than he could bring spoil from Culebra.

Senator MORGAN. The other point I want to get at was this, in regard to the present situation of the work: Are you working steam shovels on both sides? Take the Culebra cut there as the center; do you work out with steam shovels in the direction of the Pacific and also in the direction of the Atlantic?

Mr. BURR. No, sir. There has been no excavation as such from the Culebra cut, unless it has been done very lately, for several months. In October when we were there, there was no excavation being made. The shovels were practically idle. There was a little excavation being made for the purpose of laying some tracks, but the experimental shovel work which was begun a year and a half ago was abandoned last July, and no excavation has been resumed since, as I understand it, unless it has been done very lately.

Senator MORGAN. Where is the dump or spoil bank of the work that has been done there before?

Mr. BURR. There are several of them, Senator. There are three main spoil banks—one called the Larejo spoil bank, which is at a marsh about, I should say, a mile from the center of the Culebra cut, or three-quarters of a mile——

Senator MORGAN. North or south?

Mr. BURR. Northeast; or I do not know but it is more nearly north, is it not, General?

General DAVIS. It is about north-northeast. It is the head of the Obispo.

Mr. BURR. Both the old and the new Panama Canal companies used that for a long time. Then there is a small dump which was used—about half a mile, I suppose, from the deepest part of the Culebra cut, on the other side of the railroad track—but that is a very small one. Then quite a large volume of waste material has been carried to a dump or dumps toward the Pacific in the Rio Grande Valley, within half a mile of the southern end of the Culebra cut.

Senator MORGAN. On that side of the work you work with shovels as well as you do on the north side?

Mr. BURR. You would, after the work was begun, naturally work with shovels on the north end as well as the south end.

Senator MORGAN. You would approach——

Mr. BURR. You would approach the two faces.

Senator MORGAN. And work in both directions?

Mr. BURR. And work in both directions.

Senator MORGAN. That is all I want to know about it.

Senator KITTREDGE. I suggest that we take an adjournment until to-morrow morning, Mr. Chairman.

(The committee thereupon adjourned until to-morrow, Thursday, March 8, 1906, at 10.30 o'clock a. m.)

ISTHMIAN CANAL.

COMMITTEE ON INTEROCEANIC CANALS,
UNITED STATES SENATE,
Washington, D. C., Thursday, March 8, 1906.

The committee met at 10.30 o'clock a. m.

Present: Senators Millard (chairman), Kittredge, Ankeny, Morgan, and Taliaferro.

STATEMENT OF WILLIAM H. BURR, ESQ.—Continued.

Senator KITTREDGE. Mr. Burr, before you leave the subject that you were presenting to us yesterday afternoon I would like to have your views upon the question of unit prices adopted by the Commission and by the minority, if you please.

Mr. BURR. The unit prices used in both the majority and minority reports were fixed by the Board as a whole—that is, they were concurred in by both the majority and the minority.

Senator MORGAN. For all classes of work?

Mr. BURR. For all classes of work.

Senator MORGAN. Dredging and blasting and digging and all?

Mr. BURR. The whole of it; everything.

Senator MORGAN. And hauling?

Mr. BURR. Every item of that statement was concurred in by the entire Board.

Senator MORGAN. Very good. So that you had no trouble about applying the unit to the work?

Mr. BURR. None whatever. There were differences of opinion in the Board. I believe that some of those unit prices are too high, and I so stated when we were discussing that matter; but I concurred in the schedule as being the best that could be arrived at under the circumstances, and believed that any errors involved in their use would be on the safe side—that is, that they would make the work apparently cost more than in my judgment it actually will cost in construction.

Senator TALIAFERRO. The Board undertook, however, Mr. Burr, to arrive as nearly as possible at the exact cost of this work upon which they agreed on the unit prices?

Mr. BURR. They did. The work was referred to a special committee, and of course every member of the Board also took great interest in it and gave it a careful study. It was a piece of work that was done with the most earnest attempt to ascertain prices which would truly represent the cost of the various classes of material and

work involved. Such results are always more or less of a compromise in a body of nine men.

Senator KITTREDGE. There were thirteen men in this Board.

Mr. BURR. I should have said thirteen. I had the number of the old Commission in mind instead of the new Board.

Senator MORGAN. I would like to ask you a question right there. In applying these unit prices, upon which you all agreed for the work to be done, you then ascertained, I suppose, the cubic measurement of what you considered to be the different varieties of work that would have to be done—for instance, rock work, earth work, and dredging?

Mr. BURR. We did—with great care.

Senator MORGAN. You did not preserve the data laid before the Commission as to those estimates of the different varieties of work which was required to be done?

Mr. BURR. No; not the details of all the quantities which many of the individual members of the Board used. We have the details of the main computations.

Senator MORGAN. Did you disagree in regard to the main computations? For instance, as to the amount of dredging, the amount of rock work, and the amount of earth work.

Mr. BURR. Not to any material extent.

Senator MORGAN. You agreed pretty harmoniously upon those computations?

Mr. BURR. Yes.

Senator MORGAN. And as to how much of each kind of work would have to be done?

Mr. BURR. We did.

Senator MORGAN. I merely wanted to know about that. In arriving at those estimates did you take the French surveys and the French borings as a basis or the American?

Mr. BURR. Our main data were those obtained from American engineers and the results of American surveys. We, however, gave weight to all the information which we had, including the results of surveys and borings and other similar investigations made by the French companies; but our main data were those which have been obtained under the American régime.

Senator MORGAN. In ascertaining what was below the surface, of course it is conceded that you had to rely upon borings more than upon anything else?

Mr. BURR. You may say practically all the borings were made since the American occupation and by American engineers.

Senator MORGAN. Do you consider, now, that those borings were altogether sufficient to enable you to form a correct judgment as to the different varieties of work that you would have to do, and the quantities of it that would have to be done?

Mr. BURR. For all practical purposes.

Senator MORGAN. They are reliable?

Mr. BURR. They are reliable.

I want to speak for a moment about one item, as it has been criticised in different quarters, and that is the cost of removing rock under water, and the cost of all material below the elevation of plus 10, in the Culebra cut.

Senator KITTREDGE. What do you mean by "plus 10?"

Mr. BURR. Plus 10 means 10 feet above mean sea level.

Senator MORGAN. Above mean sea level?

Mr. BURR. Yes. Plus 10 means that.

Senator MORGAN. That is the highest range of the spring tides?

Mr. BURR. No, Senator. This has no reference to the range of spring tides.

Senator MORGAN. Yes.

Mr. BURR. It was an arbitrary elevation below which it was the judgment of the Board that the work would cost more than that above it.

Senator MORGAN. Yes.

Senator TALIAFERRO. In arriving at the mean level, you take into consideration the extremes of the tides, do you not?

Mr. BURR. Yes; we did, in fixing that datum. The mean sea level is the same on both sides of the Isthmus, and it is the mean between extreme high and extreme low water.

Senator TALIAFERRO. Yes.

Mr. BURR. The cost of rock removed under water at \$2.50 a cubic yard conforms well with the general range of prices for that class of work in this country. There are improved means of taking rock out under water which may and probably will reduce that unit cost. That was one of the unit costs which, in my mind, was taken too high; but I concurred in the judgment of the Board, and I stand by it.

At the present time there is a large contract in progress involving the excavation of about 2,000,000 cubic yards of hard sandstone rock, I think, in the St. Marys River, which is being done at \$1.36 per cubic yard. That is, it is rock under water, strictly speaking, but the contractor is taking it out by putting a dam across the St. Marys River above and below the location of the rock, unwatering the inclosure, and actually taking the rock out in the dry. But when the contract was awarded it was rock under water, and its cost is \$1.36 per cubic yard.

Rock is being taken out under water in Europe at the present time with what is known as the Lobnitz chisel, which is a great steel bar with one end sharpened in the form of a chisel, weighing 15 or 20 tons, perhaps, for from 50 to 70 cents per cubic yard, where the cost of labor is much less than it is in this country. The Lobnitz chisel has been used to some extent in this country, but has not so far been found a commercial success, although I believe that is due not to any lack of excellence in the method, but probably to lack of proper management of the work. However that may be, \$2.50 per cubic yard is certainly a most generous price for the removal of rock under water on the Isthmus. I believe it can be done for materially less than that.

The other item which has been criticised is the unit price of \$1.25 per yard for all material below the elevation of plus 10, or a plane 10 feet above mean tide in the Culebra cut. That price was agreed to by the entire Board. It was not a majority price; it was not a minority price; it was a price fixed upon by the entire Board, and it was done in view of the possibility of taking out some rock under water in the lowest part of the cut below sea level, and in view of the further fact that the rock near the bottom of the cut is harder, as a whole, than that above it. It was the judgment of the Board that

the difficulties which would arise below that plane were such as would justify that price and would be covered by it, while the price of the excavation above plus 10 is 80 cents per cubic yard. I have no idea that any rock in the lower part of the Culebra cut will ever be taken out under water. I know of no reason to suppose that it will be.

Senator KITTREDGE. Why?

Mr. BURR. Because contractors in this country and everywhere else pump out such pits or deep excavations, if any water gets into them, and do the work in the dry, which is much cheaper and much quicker. It is a constant practice, and I know of no reason to suppose that there would be any troublesome amount of water in the bottom of that excavation. There would be some doubtless, but—

Senator KITTREDGE. Are conditions in the Culebra cut favorable for doing work in that manner?

Mr. BURR. They are. They are very favorable; and, further, the price of \$1.25 is, to a certain degree, a combination of the \$2.50 price and the 80-cent price.

(By request of Senator Morgan, the stenographer read a preceding statement of Mr. Burr's, as follows:)

"I have no idea that any rock in the lower part of the Culebra cut would ever be taken out under water. I know of no reason to suppose that it will be."

Senator MORGAN. You mean be taken out while water is upon it?

Mr. BURR. I mean the water would be pumped out in the usual way.

Senator MORGAN. Yes.

Mr. BURR. And the rock excavated in the dry; the ordinary procedure under such circumstances.

Senator MORGAN. It would be practically dry work?

Mr. BURR. Yes, sir.

Senator TALIAFERRO. Is not 80 cents for the work in the Culebra cut above plus ten a very generous estimate—a liberal estimate?

Mr. BURR. Yes. That was one of the unit prices which I specially contended was too high. I believe it to be so. The experience which has accumulated on the Isthmus since the American occupation in the use of our steam shovels under the most disadvantageous circumstances of poor equipment, poor tracks, and with all conditions against them, shows that the price of taking out that hard rock has been as low as a little above 40 cents. I think that 80 cents a yard is too high. So that the estimated cost of that part of the work, for both plans, whatever the plan may be, is certainly generous.

Senator TALIAFERRO. My recollection is that Mr. Stevens estimated that amount at 60 cents. I do not recall certainly.

Senator KITTREDGE. Was it not Mr. Wallace that said that? I do not remember.

Senator TALIAFERRO. Was it Mr. Wallace?

Senator MORGAN. I have to go to the Senate, Mr. Chairman, as it is 11 o'clock.

Senator TALIAFERRO. I have to go to a committee meeting, Mr. Chairman, and if Professor Burr has reached a point where he can just as well stop, I move that the committee take a recess until 11.30.

(The committee thereupon took a recess until 11.30 a. m., at the expiration of which the hearing was continued.)

Senator KITTREDGE. Had you completed what you desired to say upon the question of prices when we took the recess?

Mr. BURR. That was all that I wished to say in answer to your question.

Senator KITTREDGE. Had you some questions that you wished to ask, Senator Morgan?

Senator MORGAN. I have some questions that I want to ask Mr. Burr.

I want to ask you a question, Mr. Burr, to remove a perplexity that is in my mind about the way of doing this work on the sea-level plan. That plan contemplates a depth of 40 feet below sea level for the prism of the canal?

Mr. BURR. It does.

Senator MORGAN. And a very considerable part of the length of the canal will pass through a mountainous region, probably 18 miles long—or a hilly region, I will call it?

Mr. BURR. Somewhat more than that.

Senator MORGAN. High ridges?

Mr. BURR. The higher ground—not all mountainous—but the higher ground of the entire line covers about 24 miles, from Bohio to Miraflores.

Senator MORGAN. In that, of course, there will be springs of water as you dig down. You will uncover springs of water?

Mr. BURR. Probably; as one usually does.

Senator MORGAN. You have done it already?

Mr. BURR. To a slight extent only in the Culebra cut, so far as it is now excavated; but undoubtedly the usual features of deeper excavation would be disclosed.

Senator MORGAN. And you will have to contend with the water that will find its way into the bottom of the canal from a rainfall of 25 feet a year?

Mr. BURR. Oh, no, sir. The rainfall of 25 feet a year pertains to Greytown, fortunately, and not to Colon.

Senator MORGAN. About what would it be?

Mr. BURR. Well, on the Caribbean side it is about 125 or 130 inches per year, and on the Panama side about half of that. At Culebra it has some intermediate value between those two.

Senator MORGAN. About how many feet a year?

Mr. BURR. I suppose in the Culebra cut, or in the vicinity of Culebra, the average rainfall averages somewhere around 100 inches, or 8½ feet. Perhaps General Davis can correct me on that.

General DAVIS. It is about 90 inches at Culebra.

Senator MORGAN. This canal prism is carried to the level of 40 feet below sea level?

Mr. BURR. Uniformly.

Senator MORGAN. I can not understand how you are going to keep the sea water from the Bay of Panama out of the canal while you are digging it 40 feet below mean sea level, if you open your diggings in the Bay of Panama and your dredging, or whatever it is, in the Bay of Panama and advance toward the Culebra Heights. What project or plan is there for keeping the sea water out of those diggings while you are conducting them down to 40 feet below sea level?

Mr. BURR. As I stated yesterday, in the low portions of the line, between Colon and Bohio, for instance, and between La Boca or the

tidal lock at Sosa Hill and Miraflores the presence of water is advantageous, because it floats dredges which can be used in taking out all the soft material over those portions of the line.

Senator MORGAN. I understand that.

Mr. BURR. And there is little else but soft material between Bohio and Colon. Between Miraflores and the deep water on the Panama side there is a large amount of rock to be taken out. That hard rock may be excavated in a number of different ways, which would be found most advisable when the work is done. That is, it may be blasted under water and taken out by dredge in the ordinary way, which would probably be the method to be pursued in the approach channel in Panama Bay; and between Sosa Hill and Miraflores it is probable that a portion of the rock would be taken out in the same way, and that other portions would be taken out by building a dam on either side, a great cofferdam, unwatering that and taking the rock out in the dry, just as MacArthur Brothers are now doing in St. Marys River, at \$1.36 a yard, while we have allowed \$2.50 a yard; or there may be other methods which it would be found advisable to follow as the work progresses. That covers the low grounds on either end of the canal.

Senator MORGAN. Up to Miraflores on the Pacific side and up to, we will say, Obispo on the other side?

Mr. BURR. No; not to Obispo, but Bohio.

Senator MORGAN. To Bohio?

Mr. BURR. Yes; on the Caribbean side.

Senator MORGAN. Very good.

Mr. BURR. Between Bohio and Obispo, or Bohio and the Culebra cut—because that is where the Culebra cut begins—there is a variety of material. Some of it might be taken out by dredges, and a large portion of it would undoubtedly be taken out by steam shovels, all in the dry. The rock—because there is a considerable quantity of rock between Bohio and Obispo—would be taken out probably by making great cofferdams, if necessary, or wherever necessary, for the deeper portions of those cuts, the Chagres waters meantime being carried entirely out of the present channel of the river in diversion channels, which I think are shown on this map here. Yes; they are shown as mere lines along here on one side of the Chagres channel [indicating on map].

Senator MORGAN. By “in the meantime” do you mean while you are constructing the work?

Mr. BURR. Yes; while we are constructing that portion of the canal prism; and they are provided for in the estimate. That would cover all the line from Bohio to Obispo. From Obispo to Pedro Miguel or Miraflores we have the great Culebra cut that we have already talked about. There would be a short portion at the southerly end of the Culebra cut between that and Miraflores, a very short portion, where the conditions would be such that the earth on the top of the rock would be taken out by steam shovels, and the rock below would be taken out probably by building small cofferdams or some other similar process; but all of the rock below sea level, if it is taken out under water, is covered by the \$2.50 cubic yard price, which is sufficient for the most difficult part of the work whatever it may be.

I do not believe myself that much rock between Miraflores and Obispo would be taken out under water. I think it would be taken

out by blasting and excavating in the dry in the ordinary method. That is the usual procedure, and I see no reason whatever why it should not be done there. Such water as finds its way into the pits would be pumped out.

Senator MORGAN. In approaching the elevation which you marked from Obispo to Miraflores as being the Culebra cut—in approaching that elevation on the Panama side or from the Caribbean side, you would approach with dredges?

Mr. BURR. You would approach with dredges up to Bohio.

Senator MORGAN. Up to Bohio on one side and up to Miraflores on the other?

Mr. BURR. Yes, sir.

Senator MORGAN. Very good. Now, you would be down 40 feet below sea level with those dredges?

Mr. BURR. Yes, sir.

Senator MORGAN. The ocean would follow you in?

Mr. BURR. We should want it to for those portions of the line.

Senator MORGAN. As a matter of course. Now, when you go to pump out your intermediate pits, I will call them, or diggings, how are you going to keep that ocean water out?

Mr. BURR. By dams, in the usual way. It is an ordinary procedure, constantly resorted to by engineers and contractors. It would be kept out precisely as MacArthur Brothers are now keeping out the waters of St. Marys River from that stretch of channel a mile or two long or more. I have forgotten how much it is.

Senator MORGAN. Can you keep it out so as to make the work you are doing in these deep cuttings practically dry work?

Mr. BURR. Yes, sir; practically dry work.

Senator MORGAN. All the way through?

Mr. BURR. Yes, sir; there is no unusual difficulty presented.

Senator MORGAN. Are all the arrangements or machinery, dams and cofferdams, and the like, such as you have mentioned, and many other things which you have not mentioned now because you can not anticipate what will be needed—are all those taken into consideration in the estimate of \$2.50 per cubic yard that you have mentioned for the digging?

Mr. BURR. They are. They are taken into account in every unit price which covers that part of the work.

Senator MORGAN. So that we can regard the \$2.50 a cubic yard as the maximum cost of all the work that is to be done in carrying this canal down to 40 feet below sea level?

Mr. BURR. You can; and it is a very generous estimate, in my judgment.

Senator MORGAN. I did not have it clear in my mind, and I wanted to get it on the record in clear form.

Senator TALIAFERRO. That is, that \$2.50 applies merely to the rock work?

Mr. BURR. To rock work under water.

Senator TALIAFERRO. To rock work under water?

Mr. BURR. It applies to rock taken out under water.

Senator TALIAFERRO. The Senator's question was general, and the record may make it appear that the \$2.50 is the maximum price of the total work between the points he named instead of the rock work under water.

Mr. BURR. It is the maximum unit price per cubic yard of all grades of work that will be done there.

Senator TALIAFERRO. The maximum unit price?

Mr. BURR. The maximum unit price. It applies to rock under water, which is the most expensive work that will have to be done.

Senator MORGAN. And this great Commission of which you are a member concluded that \$2.50 a cubic yard was a liberal estimate for the cost of all the work, whether dry or wet—that is, for all the hardest work, the most expensive work?

Mr. BURR. It decided upon that as a unit price for the most expensive work; yes.

Senator MORGAN. And the entire Commission agreed on that?

Mr. BURR. The entire Commission agreed on that unit price; yes, sir. If rock is to be taken out in the dry, where it is not under water, then the unit price is \$1.50 per cubic yard.

Senator KITTREDGE. That is, the maximum unit price?

Mr. BURR. It is a little confusing to use the word "maximum." Two dollars and fifty cents is the maximum of all the unit prices contemplated in this work. There is nothing higher than that.

Senator KITTREDGE. Yes.

Mr. BURR. And that covers rock under water. If that same rock is taken out in lock pits, in the dry, below elevation minus 10, it is \$1.50 per cubic yard. If it is taken out in the dry, without being below minus 10, except in Culebra cut, it is only \$1.15, and so on.

Senator TALIAFERRO. And the shovel work? Just continuing the estimates, you might include the shovel work in your answer.

Mr. BURR. The shovel work for earth in the dry, except in Culebra, is 40 cents per cubic yard. In Culebra it is 80 cents per cubic yard, because that means the hardened clay, or rock in process of decomposition, which has not yet become soft, or, on the other hand, if it is clay that is being hardened, that has not yet become a hard rock.

Senator TALIAFERRO. So that these estimates run from 40 cents per cubic yard for the easiest shovel work to \$2.50 for the most difficult rock work under water?

Mr. BURR. Yes, sir; that is it.

Senator KITTREDGE. Now, Mr. Burr, will you please give us your views about the lock plan, as proposed by the minority of the consulting board?

Mr. BURR. The lock plan, I assume, is familiar to all the members of the committee, as including a summit level of 85 feet above mean tide from Gatun to Pedro Miguel, where one lock of about 28 or 29 feet lift, if I remember right, brings the water down to the level of Lake Sosa, with a flight of two locks in series at Sosa Hill bringing the level down to mean tide in the Bay of Panama.

Senator KITTREDGE. You mentioned an elevation of 80 feet. Is it not 85 feet?

Mr. BURR. I intended to say 85 feet. If I said 80 feet, I intended to say 85. That summit level is maintained at the Caribbean end by the great earth dam at Gatun and by the lock at Pedro Miguel at the other end. There are three dams, comparatively short, one on either side of Sosa Hill and one between Ancon Hill and Corozal, the elevation of the surface of the water in Sosa Lake being 55 feet, if I remember correctly, above mean tide.

Perhaps the most prominent feature of the plan is the earth dam at Gatun, with the flight of locks of three in series in that structure.

There are some features of the construction of that dam which, while not being absolutely new, make it an untried structure under such circumstances as those found at its location. They are features which I have already criticised to the Board, and I shall state my objections, if it is agreeable to the committee, at this time.

The CHAIRMAN. That is what we want, sir.

Mr. BURR. The project of a dam at Gatun is a very old one. In fact, it was first broached at the International Scientific Congress held at Paris in 1879, and has been broached at various times since, but never seriously considered as a desirable part of a canal project until the considerations of the minority brought it into its present shape. As you are aware, the deepest bed rock found on the line of the dam is 258 feet below sea level.

Senator MORGAN. At Gatun?

Mr. BURR. Yes; at Gatun.

Senator KITTREDGE. Mr. Stevens, in his testimony, as I recollect it, stated that the deepest point to solid rock was 204 feet. Is he in error in that regard?

Mr. BURR. He must be in error. I think that that must be an oversight, because 258 feet, as I remember, is the exact result of the borings. Is not that so, General?

General DAVIS. Yes. They are reported by one of Mr. Stevens's assistants.

Mr. BURR. Yes; they are reported by Mr. Maltby, one of Mr. Stevens's assistants. I am not in error in the recollection that it is 258 feet. That is the actual depth.

Senator KITTREDGE. And the records so show it?

Mr. BURR. Yes, sir; and the records so show it. If Mr. Stevens mentioned 204 feet I think that must have been an oversight; 258 feet is certainly correct. I was looking at the section this morning, and I am inclined to think that that figure is shown on a profile in the minority report. If the committee will pardon me a moment, it will not take more than a moment to verify that.

General DAVIS. It is on plate 12.

Mr. BURR (referring to map). It is 258 feet—that is, the actual figure is not given, but it is more than 250 feet, and carrying out the proportion would make it 8 feet more, or 258 feet. I am very glad that that point has been brought up.

The subsurface material penetrated by these borings, which were made to a considerable extent—all the later ones—at the request of the Consulting Board, is shown on the profile to disclose the variety of materials which we find all up and down the Chagres River as overlying the bed rock.

Senator KITTREDGE. Is there a map with us showing the character of the borings?

Mr. BURR. This profile shows it, with one exception, which I will mention in a moment. You will see that various classes of material are exhibited—clay, clay and sand and sandy clay and gravelly material. The material is of varied character, and it is exceedingly irregular, as is shown not only by those borings, but by the numerous other borings, for hundreds of them have been made all along the Chagres, particularly at Bohio, at Buena Vista, at

San Pablo, and all the way up to Gamboa, even. There appears to be actual confusion in the way in which those finer portions of material, such as sand and clay and gravel, have been deposited along the geological valley of that river.

Senator KITTREDGE. What do you mean by the geological valley?

Mr. BURR. I mean the valley that would appear if all the fine material—clay, sand, and gravel—above the bed rock were taken out of the valley of the Chagres; the remaining irregular channel along the surface of the bed rock is what we call the geological valley of the river. That has been gradually filled up during ages, until the surface has reached its present elevation.

Senator KITTREDGE. In making these borings, Mr. Burr, did any water appear at the surface?

Mr. BURR. It did, sir, in a number of those borings.

Senator KITTREDGE. Is it shown on this map?

Mr. BURR. It is not shown on that map, and I presume it is through some oversight. It is a very important detail of that examination, and should be shown. The water appeared and flowed slowly over the top of the pipe—that is, with a head of a quarter of an inch or half an inch or three-quarters, as it might be, at various depths, from 32 feet down to nearly 258 feet, showing that permeable material is likely to be found at practically any depth below the surface.

Senator KITTREDGE. Beginning how close at the surface?

Mr. BURR. Thirty-two feet, as shown by those borings. If other borings were made, you would probably find places where it would appear nearer the surface.

Senator KITTREDGE. Did you have before you—and by you I mean the Consulting Board—maps showing the flow of water to which you have just referred?

Mr. BURR. We did. Not all of those borings which showed water, but some of them were made at the request of the Consulting Board. As fast as borings were made and the data secured, the results were cabled to the Commission and the Commission gave them to the Board, so that the profile was made showing the portions of the borings within which the water appeared. The latter by some oversight have been left off.

Senator KITTREDGE. What do you call that map? It is marked here "Plate 12." What map will show the water conditions you have just mentioned?

Mr. BURR. It is the profile of the Gatundam, by Mr. Maltby, who is the assistant engineer who did the work, dated November 3, 1905.

Senator KITTREDGE. Is that map in Washington?

Mr. BURR. That map is at the office of the Commission, and is available.

Senator KITTREDGE. Mr. Chairman, I move that that map be required to be brought here.

The CHAIRMAN. I supposed there was such a map in that package of maps. But I understand it is not there?

Mr. BURR. No; it is not there. The plate before you is the one that should show the information.

Senator KITTREDGE. And it does not show any of the indications that you have mentioned at all?

Mr. BURR. Not at all.

Senator KITTREDGE. I wish, Mr. Chairman, that that map could be brought before the committee forthwith, so that we could have it for use in connection with Mr. Burr's testimony.

(A telephonic message was sent to the Commission to furnish the committee with the map referred to.)

Senator KITTREDGE. Excuse me for interrupting you, Mr. Burr. Proceed.

Mr. BURR. The fact that the water flowed gently from the tops of these pipes used in making the borings shows that the river water was in communication with the material penetrated by the pipes. If it had been artesian water—that is, water which had flowed through the earth, through crevices in the rock, or in any other way from some distant and higher ground, as in the case of artesian wells—it would have come out of the pipe with a much higher head, as it ordinarily does with such wells; but it simply flowed over the top of the pipe, not far from the elevation of the water in the river.

Senator MORGAN. You say "not far from the elevation of the water in the river." You mean not far above the elevation?

Mr. BURR. Not far above the surface of the water in the river, I mean.

That same result has been seen time and time again in connection with our borings at the Bohio site and above. Some of the borings would not show any water flowing out of the top of the pipe and other borings would show them. There is nothing new about that. It is a rather ordinary feature of our usual experience in boring at that site; but it shows conclusively that the material penetrated by the pipe is permeable, and that water from the river enters it.

Senator KITTREDGE. Will it interrupt you if I ask you a question, Mr. Burr?

Mr. BURR. Not at all.

Senator KITTREDGE. Mr. Stevens, in his testimony, said that the material through which these borings were made was impermeable.

Mr. BURR. I know he says so.

Senator KITTREDGE. Have you any statement to make about that?

Mr. BURR. Yes.

Senator MORGAN. I hardly think that is an entirely accurate statement as to what Mr. Stevens said.

Senator KITTREDGE. I have forgotten exactly what he said.

Senator MORGAN. He said that, as a rule, it was impermeable; but he did not deny that there might be pockets or places where it was not.

Senator KITTREDGE. I will change my question. I think Mr. Burr has in mind perhaps what Mr. Stevens said. You have read Mr. Stevens's testimony?

Mr. BURR. Not all of it yet.

Senator KITTREDGE. Have you read the part of his testimony relating to that subject?

Mr. BURR. No; I have not.

Senator KITTREDGE. Then I will withdraw the question, temporarily.

Mr. BURR. I have understood that he made that statement, however. But that is a mere understanding.

There is, however, this statement in the report of the minority, and I think it must be due to an oversight: "In the upper 200 feet

some of the later borings show fine sand, while other borings near by show clay at the same depths, indicating, as do previous borings, that the upper 200 feet is practically impervious material."

Senator MORGAN. That is what Mr. Stevens said: "Practically," not absolutely.

Mr. BURR. The results of these borings which show water coming up through this material from depths of 32 feet all the way down to 258 feet are directly at variance with this statement. Of course water could not appear if the material were impermeable. The fact that water does flow through it and into the pipes and out of the tops of these pipes is, of course, conclusive evidence that it is permeable. I think that that must be due to an oversight.

Further, the statement is made: "There was an outflow from several of the borings which penetrated the gravelly material in the bottom of the deep gorge, although the tops of the casings were above the surface of the river."

I do not know exactly what that sentence means, but it seems to indicate that the water only flowed from the gravelly material in the bottom of the deep gorge. If that was the intention of the statement, it is without foundation, because, as you will see when you get this profile, the water flows through material practically anywhere from 32 feet nearly down to 258 feet, and doubtless if other borings were made in sufficient number water would be found at an elevation above 32 feet below the surface, as it has been at other places.

I think that is a very important point in discussing the safety of this proposed great dam—a very important point. The results of these borings show that that material is permeable, just as similar borings show that the material is also permeable at the Bohio site. There is this difference, however, that the permeable material at the Bohio site and above the Bohio site is coarser.

Senator MORGAN. Part of it is wood?

Mr. BURR. Part of it is wood, down at the Gatun site; yes.

Senator MORGAN. And at the Bohio site, too?

Mr. BURR. And at the Bohio site also; but it is coarser, as a whole, at Bohio and above Bohio than it is below. That is for the obvious reason that when material is brought down by the river current and settles upon this lower ground the coarser material will be dropped higher up the river, where the velocity begins to decrease, while the finer material will be carried farther down until the greater breadth of channel decreases the velocity, and causes the finer material to settle. But it is to be observed that at this dam site at Gatun there is a narrowing of the river valley, so that in geologic times past, when this deposition was taking place, the current in that contracted section was much higher than in the wider part of the lake shown upstream.

Senator MORGAN. You mean the speed of the current?

Mr. BURR. The speed of the current; so that there naturally would not be as much fine material deposited at the dam site as either above it, in the wider portions of the lake, or below it. But however that may be, it is absolutely certain that the results of these borings show the material, or a very large portion of the material, to be permeable.

Senator MORGAN. Let me ask you this question right there, if you

please: Is it your view of the geological gulch of which you have been speaking that it widens as it approaches the sea?

Mr. BURR. Not necessarily, but that is usually the case.

Senator MORGAN. But did the borings that you examined show that that gulch widens?

Mr. BURR. Yes; it is wider up in the wider parts of the lake than it is at Gatun, for instance, and it is wider in the wider part of the lake than it is at Bohio and above Bohio; but it is very irregular. The geologic valley, so to speak, was very wide through here. It narrowed down at Gatun. These high hills are points of rock sticking up, covered, of course, with clay and vegetation; and so it is with all this high ground. But the geologic valley, so to speak, was comparatively wide halfway between Gatun and Bohio, but narrow at both Gatun and Bohio.

Senator MORGAN. Is it your idea that that was originally an arm of the sea running up as high as Gamboa?

Mr. BURR. Probably, but we do not know. The elevation of the entire Isthmus, geologists think, has changed from one age to another, so that we do not know how far up the sea may have gone. But undoubtedly it had a very different delimitation inland from that which it now has.

Senator MORGAN. Have you ever seen any sharks' teeth that were found between, say, Gamboa and Miraflores?

Mr. BURR. I have not seen them; I have heard of them.

Senator MORGAN. You remember that Colonel Ernst saw them and found them?

Mr. BURR. Yes; I think he did. I had forgotten that for the moment.

Senator MORGAN. He found them 40 feet or 50 feet above sea level.

Mr. BURR. We have seen even more remarkable appearances in some parts of the Rocky Mountains, two or three thousand feet above sea level; we have there evidences of sea action and ancient sea life.

The very fact that this material filling the geologic valley is of an irregular character—some impervious clay, some mixture of sand and clay, and others of open sand, such as that penetrated by these borings—is, to my mind at least, demonstrative evidence that water may find its way through material under a dam of that character, with a head of 85 feet above it, which is equivalent to a pressure of not far from 40 pounds per square inch.

It is proposed to build this dam by simply cleaning off the surface material and then spreading the earth suitably selected from the canal excavation in layers, and so building it up to a height of 135 feet, making its base something like a half a mile wide. In my judgment that is a dangerous experiment upon a colossal scale which this Government is not justified in undertaking. I wish to say at this point that I have no objection to an earth dam anywhere under suitable conditions. In fact, I think it is a most valuable type of structure, and I do not see why an earth dam may not be built of any height if properly designed and founded. But in all cases it is my clear judgment—and that based upon years of experience in connection with the underground flow of water—that suitable means should be taken absolutely to prevent anything like flow through the permeable material under the dam; and no such means are provided in this design.

The means of accomplishing that end may take a variety of shapes. It may be a masonry core wall, if the bed rock is not too deep; and that is a common type of construction in this country. There are many such dams. Again, abroad, that core wall, instead of being of masonry, is sometimes of puddled clay; but that is equally effective to prevent any subsurface flow of water. In this country we have, within the past few years, constructed dams in some localities without either a masonry core wall or a clay core under conditions which justified that kind of construction; and those dams have stood satisfactorily. On the other hand, we have a record of numerous failures of earth dams from water getting through them and under them, sometimes through them along a pipe laid in the embankment, and sometimes by finding its way under the dams in precisely the manner that I should apprehend might take place in this case. There are numerous instances of that kind.

Senator KITTREDGE. Can you give us one or two?

Mr. BURR. I should have made a record of some of those dams, and I think I have a note of them.

A very complete account of some of those cases is found in a paper by Mr. William R. Hill, in the proceedings of the American Waterworks Association for 1902. One instance is that of the Mill River reservoir dam, at Williamsburg, Mass., which gave way on May 16, 1874. It was an earth dam, with a masonry core wall 43 feet high—about one-half the depth of water which would exist in this dam. Its area was 114 acres. One hundred and forty lives were lost, and about a million dollars' worth of property was destroyed.

That was, of course, a much lighter dam than this, and I would willingly accord all the additional presumption of safety to this dam which goes with its greater mass. But the failure of that dam shows what may take place in this dam or any other one of a similar character under similar conditions.

Then, again, there is a reservoir which has been completed for the Borough of Brooklyn, called the Milburn reservoir, which I have inspected in the course of my professional work for the city of New York, which was completed in 1893. That reservoir was completed under engineering specifications, with a puddled bottom, designed and put in place for the express purpose of preventing leakage. Yet when it was filled with 43,500,000 gallons of water it all leaked out in ten days, and that reservoir has never been in use since. That shows what water will do when it has a chance, even in so-called impermeable material.

As stated in the majority report, nothing is more common in the experience of waterworks engineers than to observe the underground flow of water through permeable or semipermeable material. In fact, many water supplies depend upon that flow, such as the Borough of Brooklyn and many other cities that take their water from the deep underground sands or mixtures of sand and earth. You will find frequently small passages of water, some of them threadlike in magnitude, almost capillary passages, and from that up to passages that flow many gallons a minute. There are wells fed by such water on Long Island; and in our recent examinations for a tunnel under the Hudson River near New Hamburg we found such a passage by diamond-drill borings, about 260 feet, if I recall the depth rightly, below the surface.

Senator KITTREDGE. When was that, Mr. Burr?

Mr. BURR. Perhaps two months and a half ago; and those are not uncommon experiences. They are within almost, you may say, the daily experience of hydraulic engineers or civil engineers engaged in that class of work.

You may make dams of sand, even, that will gradually silt up and be water-tight. There is no question about that. You may put a dam of this character at this place, and it might stand. I do not say that it possibly would not. But I do say that whether it will stand or not is mere conjecture. As an engineering guess, you might say that it probably would stand; but there is the imminent engineering possibility that the subsurface flow caused by this great head of water, 85 feet, would force a seepage—a mere seepage at first—which would gradually increase as it has elsewhere, coming up perhaps half a mile below the dam.

There is nothing uncommon about water flowing through a half mile of such material. If that dam were built and water were discovered coming up through the earth on the downstream toe and below it, it would be a source of continual apprehension as to what the result was going to be—whether the dam would not break out and discharge all its contents, as other dams have done, like the Mill River dam.

Senator MORGAN. Springs and rivers flow beneath mountains, do they not?

Mr. BURR. They do.

Senator MORGAN. And the mountains stand, as in the case of the Humboldt River?

Mr. BURR. They do; they stand. Sometimes, however, large banks of earth are carried away by precisely those springs. I have seen that a number of times.

In such cases the water comes from not great depths, but it has through long ages made a channel for itself, and it does not flow under any great head.

Senator MORGAN. The cores put into earth dams, I suppose, are intended to prevent this very underflow?

Mr. BURR. They are.

Senator MORGAN. Do they necessarily rest on the rock bottom?

Mr. BURR. Not necessarily. They may rest on a truly impervious bottom.

Senator MORGAN. A clay bottom, for instance?

Mr. BURR. Yes; or a hardpan bottom.

Senator MORGAN. Or hardpan?

Mr. BURR. Yes.

Senator MORGAN. It is not necessary to carry them down to the rock in order to make them useful?

Mr. BURR. Not necessarily; no.

Senator TALIAFERRO. Did not this Mill River dam have a masonry core?

Mr. BURR. That had a masonry core. Water found its way under that also, but it was not carried down to rock. It was constructed in an earth excavation.

Senator MORGAN. It was not carried down to rock?

Mr. BURR. It was not carried down to rock; no.

Senator KITTREDGE. What was the distance between the lower part of that foundation and the rock?

Mr. BURR. I can not give you the details, because I have not the data; but it was evidently pervious enough to let water through, because it led to the destruction of the embankment.

Senator MORGAN. Mr. Stevens seemed to lay great weight or stress upon the pressure of the superincumbent mass of earth of which the dam was to be composed, say, half a mile in cross section—that it would destroy the permeability of the material below if any serious difficulty of that sort existed. What do you think of that?

Mr. BURR. It would improve the condition, there is no doubt about that. Anything which adds weight to a permeable and compressive material will tend to make it more nearly impervious. But the question arises, Senator: Does the United States Government desire to construct this great waterway as a water connection between oceans, and practically for all time, and make its chief sustaining feature of such a character that its stability is not absolutely assured, so far as it can be by human means?

Senator MORGAN. I can only say in regard to that, that the United States Government did precisely that thing when they adopted your own recommendation for the dam at Bohio, and changed the whole canal system from Nicaragua to Panama. That was exactly what caused it.

Mr. BURR. I do not think, Senator, that the Bohio dam or even that plan was ever adopted by the United States Government.

Senator MORGAN. They did not adopt any other.

Mr. BURR. No; they did not adopt any; but they did adopt the recommendation of that Commission for the Panama route.

Senator MORGAN. And on that basis—that a dam could be successfully built at Bohio, and that that was the key of the canal.

Mr. BURR. It can be successfully built at Bohio.

Senator MORGAN. We will get to that later; but that was the basis on which we adopted it.

Mr. BURR. I think it is only fair and just to state, Senator, that if that were the basis (and it seems to me it is going a little too far to say that it was), that dam had a solid masonry curtain going down to what was supposed to be bed rock. We took no chances on seepage.

Senator MORGAN. You took no chances on seepage, except that you left 40 feet without being bored out at all between the 128 and the 168 feet depths, I will say—the difference between your borings and Wallace's borings. You left that without being bored out.

Mr. BURR. About 28 feet, I think—no; 40 feet: that is right.

Senator MORGAN. It is the difference between 126 and 168.

Mr. BURR. Well, those examinations were made as thoroughly as they could be with the time at the command of the Commission.

Senator MORGAN. Were they made with churn drills or diamond drills?

Mr. BURR. They were made with the jet boring process, but with appliances which permitted any boulder to be broken up by dynamite, so that there was not any essential doubt as to being on bed rock at the point where the borings were put down. But the deeper points which were subsequently found by our borings, made under the direc-

tion of Mr. Wallace and at the direction of the Commission, were not where the first borings were put down, but between them.

Senator MORGAN. On the same line, though?

Mr. BURR. On the same dam line, yes.

Senator MORGAN. The same dam line?

Mr. BURR. Yes.

Senator MORGAN. Now, your borings before that, that you had made in the Nicaragua examination, were made with diamond drills?

Mr. BURR. We used both at Nicaragua—both.

Senator MORGAN. But the borings at Conchuda were made with diamond drills?

Mr. BURR. Some of them were; not all.

Senator MORGAN. If there was any exception, it was not stated in the testimony that you gentlemen gave before that committee.

Mr. BURR. I think, Senator, that if you will look back at the report and at the evidence given, you will find that jet borings were first made, and then they were supplemented by the diamond-drill borings in the ordinary way.

Senator MORGAN. For greater certainty?

Mr. BURR. Yes.

Senator MORGAN. Now, why could you not have used those diamond drills at Bohio?

Mr. BURR. We could have used them at Bohio.

Senator MORGAN. Why did you not do it, then?

Mr. BURR. Simply because it was not considered necessary at that time, and both our time and our means were limited.

Senator MORGAN. You had a million of dollars.

Mr. BURR. We did, and we had to use even more than that.

Senator MORGAN. And two hundred and odd thousand dollars in addition was expended.

Mr. BURR. And still we did not use the diamond drills at Panama, even after exceeding our limit; but we made all that were considered necessary or advisable at that time. The French had made a number of borings there and all along the line. We supplemented those by all that was necessary, in our best judgment; but as engineers frequently fail to get all foundation information that may be necessary, we did not get all that was required to complete the information there.

Senator MORGAN. But at Bohio you were practically 50 or 60 feet deeper below sea-level than you were at Conchuda, on the Rio Grande?

Mr. BURR. I do not recall the figures at Conchuda; but it is about that, I think.

Senator MORGAN. Yes. So that greater care would have been necessary at Bohio for the reason that it was very much deeper below sea-level than Conchuda was? Greater care would have been required at Bohio?

Mr. BURR. Not necessarily, Senator; not necessarily.

Senator MORGAN. I do not see why.

Mr. BURR. The line through Nicaragua was actually, in its details, an unknown line. No work had been done on it. The exigencies of that route were far greater, from the conditions attending it, than they could possibly be at Panama, where an enormous amount of work had been done.

Senator MORGAN. Had any work been done at Bohio?

Mr. BURR. Yes.

Senator MORGAN. What had been done?

Mr. BURR. Not on the Bohio dam; but there was a great deal of work done in excavating lock sites there.

Senator MORGAN. At that location?

Mr. BURR. At that location; yes.

The CHAIRMAN. Senator Morgan, will you excuse me just a moment? Mr. Burr, do you think you could finish this afternoon?

Mr. BURR. I doubt it, Mr. Chairman.

The CHAIRMAN. The reason why I ask is that Mr. Bates, who was to appear here to-morrow morning at 10.30, is in New York, and would like very much to know whether we will be ready for him in the morning.

Senator MORGAN. You had better have him here at 2 o'clock, I think.

(A gentleman present in the room stated that Mr. Bates was in Washington at the present time.)

The CHAIRMAN. I thought he was in New York.

Senator KITTREDGE. Ought we to have a meeting to-morrow afternoon, inasmuch as there is going to be a vote on the statehood bill?

The CHAIRMAN. No; we can not have a meeting to-morrow afternoon. You think you will hardly finish to-day, Mr. Burr?

Mr. BURR. I think not. I think I can finish to-morrow morning.

The CHAIRMAN. I think, then, that we will have to ask Mr. Bates to come to us on Saturday morning at, say, 10.30 o'clock.

Senator TALIAFERRO. Mr. Burr, what is the essential difference between the earth dam, as recommended at Bohio, in the majority report, and this Mill River dam, which you say gave way?

Mr. BURR. The dam at Gamboa, did you ask?

Senator TALIAFERRO. No; I mean the majority report dam.

Mr. BURR. That is at Gamboa. Do you wish to know the difference between that and the Mill River dam?

Senator TALIAFERRO. Yes.

Mr. BURR. The difference is this, that if the Gamboa dam is built as a great earth dam with a masonry core that masonry core will be founded on bed rock, started from it. The masonry core of the Mill River dam was not founded on bed rock.

Senator TALIAFERRO. It did not go down to the bed rock?

Mr. BURR. It did not go down to the bed rock. I mention the Mill River dam only because I made a note of it; but there have been other failures where there was no masonry core. My only point is simply this, that in the construction of this dam, in my judgment—

Senator KITTREDGE. You now speak of the Gatun dam?

Mr. BURR. The Gatun dam. In my judgment very grave hazards as to the ultimate stability of the work are incurred, which it seems to me should not be incurred under such circumstances. If this were a power proposition, or a municipal waterworks proposition, even, where it was necessary for the party in interest to save every dollar that could be saved and he would be justified even in running some risks in order to be economical, that is one case. Such a hazard as that might be justifiable. But in this case, in my judgment, it is not justified. It is a piece of colossal experimentation, the failure of

which would involve altogether too great interest to be subjected to that risk.

Much has been said about the weight of water even on the bottom of the lake compressing it and making the material more impervious. I grant, as every engineer must (or any sensible man, it seems to me), that wherever weight is put upon a compressible material it will make it more dense. But there is one very pertinent observation to be made in connection with that pressure here—that in consequence of this irregular variation of material that settlement would not be uniform. It would be more at some places than at others, and that would cause a break in the bottom of the reservoir wherever that variation existed and form an opening for water to find its way into the deeper pervious materials.

The dams on the Pacific side are smaller and the risks, perhaps, may be of less magnitude; but they are of the same character and there is the same objection to them, in my opinion.

The dam between La Boca and the high ground opposite would be founded largely upon the most slippery kind of mud. Anyone who has been there and seen the bottom of the Rio Grande estuary exposed at low tide I think will agree with me that it is a very lubricating material; and if you were to put a bank of earth on it, even if it were half a mile thick, I think it would be in grave danger of being pushed out bodily. I have seen such banks on a smaller scale pushed out in precisely that way.

Senator MORGAN. Do you mean by the sea?

Mr. BURR. No; by the water of the lake, which would be some 55 feet above the sea, or even 65 at extreme low tide. It seems to me that in this great work the United States can afford to build structures of assured stability. Furthermore, it is my judgment that in any portion of its work that which is built or any procedure which is followed should be of such a character as to have the assurance of successful past experience to indicate that its use is justified. I would make no new experiments on the Isthmus of Panama in connection with this work.

Senator MORGAN. We have made one that has turned out to be very expensive by adopting a plan to build the canal with the key of the situation at Bohio. We have not commenced to build the canal yet, if I understand it.

Mr. BURR. I do not understand, Senator, to what you refer. The Bohio dam?

Senator MORGAN. Yes.

Mr. BURR. That was a perfectly safe type of dam, Senator. I should stand by that.

Senator MORGAN. If you had a safe place to put it.

Mr. BURR. That is precisely what I am advocating now. I am consistent with what I did then. Mr. Morison wanted to experiment in just the same way and I opposed him.

Senator MORGAN. The plan was good enough, but you did not have any place to put it.

Mr. BURR. Well, I would not hesitate, Senator, to make a perfectly safe dam at Bohio.

Senator MORGAN. Now?

Mr. BURR. Now; with the depth of 168 feet. I should not carry the masonry core all the way down, but I would make the dam safe.

Senator MORGAN. How much money would you spend on it?

Mr. BURR. Not such a great amount. I would make it within our estimate.

Senator MORGAN. Within your estimate?

Mr. BURR. Yes.

Senator MORGAN. And you recommend to-day the plan which your committee reported for a dam at Bohio for that canal?

Mr. BURR. If I were going to express my preference for a lock canal, Senator, I should say just what I said and argued for in the consulting board, that the canal should be made with the sea-level section on the Caribbean side carried to Obispo and on the Pacific side to Miraflores, and then lock up from those two points to perhaps a 60-foot summit level, possibly an 85-foot summit level, if you please; but if a lock canal were to be built, in my judgment that should be its plan.

Senator MORGAN. Where would you put your dam to make that 65-foot elevation?

Mr. BURR. I would put the controlling dam at Gamboa, just where the sea-level plan places it.

Senator MORGAN. Why would you not put it at Bohio?

Mr. BURR. With the subsequent investigations, made since, I should prefer to carry the sea-level section to Obispo, or nearly to Obispo.

Senator MORGAN. But Wallace's investigations have disproved the practicability of putting it at Bohio, have they not?

Mr. BURR. Oh, no; I should not be willing to admit that, Senator. His investigations have shown that it would be more difficult to build there than was supposed.

Senator MORGAN. They have shown 40 feet greater depth?

Mr. BURR. Yes.

Senator MORGAN. And that would be with caisson work?

Mr. BURR. Oh, I should not take caisson work down to that depth.

Senator MORGAN. What would you do, take ice down there and freeze it, on Hanna's plan? [Laughter.]

Mr. BURR. Well, the freezing process might be applicable, but I should not expect to use that. What I should expect to do would be to go down as far as it is feasible to go with the pneumatic process, perhaps to 140 feet, with the head of water above pumped down by making a great pit around the caisson; and then, from the lowest point reached by the pneumatic process, I would put one or preferably two lines of heavy sheet piling from that point down to bed rock, 30 or 40 or 50 feet, if you please, which would make a complete curtain and shut off all possible seepage.

Senator MORGAN. Then you would build your dam on the top of that sheet piling?

Mr. BURR. On the top of that I would place my dam.

Senator MORGAN. About how thick would you have that piling—I mean the cross section of it?

Mr. BURR. Perhaps 10 or 12 inches; perhaps not so thick. I should say from 9 to 12 inches.

Senator MORGAN. You would drive down piling?

Mr. BURR. It would not be driven down; it would be jetted down. You could use a hammer to a small extent, perhaps, in a caisson chamber properly designed for it; but I would expect to put that sheet

piling down by water jet, as is frequently done. There is nothing new about that.

Senator MORGAN. Would you make that piling of wood or metal?

Mr. BURR. That is an open question. I should prefer wood, because wood is indefinitely durable when it is saturated with water.

Senator MORGAN. But Wallace says that the timber that has floated in under the bowlders that you struck there down next to the bottom of that gulch is rotten.

Mr. BURR. It decayed before it got there, then, if that is so, because we have excellent specimens of timber, you know, over two thousand years old, and I have myself seen oak branches in an excellent state of preservation taken from about 35 feet below the surface of the Harlem River in the northern end of New York. How long it has been there nobody knows, but for geologic ages, I suppose.

Senator MORGAN. Have you found any pine still existing in such places?

Mr. BURR. No; I have never seen pine.

Senator MORGAN. Would you make your sheet piling, then, of very hard wood?

Mr. BURR. Not necessarily. Any wood will endure if it is saturated.

Senator MORGAN. Then you would have a sheet piling down there which would prevent the permeation of water, and you would have your dam resting upon that?

Mr. BURR. No; the dam would not rest upon that sheet piling, Senator. It would rest upon the whole gravel base.

Senator MORGAN. Into which you had driven sheet piling?

Mr. BURR. Into which the sheet piling was driven. The function of the sheet piling would not be to support anything, but simply to make a cut-off for the water; and if it were found impracticable to run that sheet piling all the way across, you could inject cement in that gravelly material overlying the bedrock, and so close up any possibility of material seepage.

Senator MORGAN. And build a stone wall out of cement below there?

Mr. BURR. And force in the cement; yes.

Senator MORGAN. It is a stone wall after it is built, is it not?

Mr. BURR. Yes; that is it exactly; it is a stone wall.

Senator MORGAN. How would the structure thus formed compare, in respect of its security, with the proposed dam at Gatun that has been suggested by the minority of this committee? Which would you prefer?

Mr. BURR. I think it would be much superior to the proposed Gatun dam.

Senator MORGAN. It would?

Mr. BURR. In my judgment it would be far superior. In fact, it would be a structure beyond criticism—that is, it would be of assured stability.

Senator MORGAN. In constructing the Gatun dam, could they not use this sheet piling as well as you could at Bohio?

Mr. BURR. I think they could.

Senator MORGAN. Yes. Do you think they should?

Mr. BURR. And I think they should, or something equivalent to it.

Senator MORGAN. That can be done?

Mr. BURR. It can be done. Properly done, it would add largely to the cost; I do not know how much, but it could be done. I do not know whether you could carry the sheet piling down to 258 feet. I think that is a matter of grave doubt; but you might do something—

Senator MORGAN. You could do it with the assistance of the caisson process to get down to where you would start to drive your sheet piling, or to insert it through pumping out the material?

Mr. BURR. You could use sheet piling to a great extent, so far as it would go, and then resort to some such process as injecting cement—something of that sort.

Senator MORGAN. After all, that would be about the best plan, would it not?

Mr. BURR. It would if you could depend upon closing up everything; but when you inject cement in gravelly material you hope to close everything, but you can not always depend upon doing it.

Senator MORGAN. If you put pressure on it, you can do it.

Mr. BURR. You can get a large amount of cement into a very close material; but whether you could close up a geologic valley, so called, two or three hundred feet wide is another matter—you could doubtless close it up near enough for all practical purposes.

Senator MORGAN. Yes; that is what I am getting at. You could not make it water-tight, perhaps. That is all I have to ask about.

(The committee thereupon took a recess until 2 o'clock p. m.)

AFTER RECESS.

STATEMENT OF WILLIAM H. BURR, ESQ.—Continued.

The CHAIRMAN. Proceed, if you are ready, Mr. Burr.

Mr. BURR. The next feature of prominence in the plan of the minority is the group of locks—three in series at the Gatun dam, the single lock at Pedro Miguel, and the two at Sosa Hill. But I refer especially to the three in series at the Gatun dam. Unless the members of the committee desire to ask some questions regarding the safety of operation of the locks, I shall not add much to what is stated in the majority report on that point.

Senator TALIAFERRO. Is the question of the safety of operation of those locks fully set forth in the majority report?

Mr. BURR. Yes; it is fully set forth in the majority report.

There are only one or two matters which I wish to mention in addition to what is stated there. I wish to emphasize the fact that the experience in operating the St. Marys Falls lock is not a safe basis for forming a conclusion as to the safety of six such locks as those proposed in this plan, three of them being in series. In the first place, the lift of each of these locks is nearly 50 per cent greater than the lift at St. Marys Falls. Some of them have a lift fully 50 per cent greater. The dangers arising from a combination of machines or appliances are not simply in proportion to the number of parts or the number of machines. They increase at a more rapid rate simply because an accident to one may induce an accident to its neighbor.

An accident to one of the locks in series might easily extend to the lock below it, whereas if it were a lock standing by itself, as the lock

at the Soo is, the damage would cease with the one lock. So that the dangers arising from the operation of three locks in series are considerably more than three times the dangers that would arise from operating one of those locks by itself; and that is one of the reasons, though not all of the reasons, why a number of members of the board of consulting engineers recorded their objections against locks in series.

If a lock canal was to be built, they said—and I was one of the number—that it should be under such a plan that each lock would stand by itself, so that if any one lock should meet with an accident, the effects of the accident would stop there and not perhaps be communicated to others. In that way the damages resulting from serious accident would be limited. The minority propose to operate these locks in series in such a way as to make one ship follow another as closely as possible—that is, there would be two ships in the series of three locks at the same time, and their estimated capacity is obtained by assuming that there may be two ships; indeed, that there will be two ships at once going in the same direction in the series of three locks. I question very much whether it would be considered safe to operate that series of three locks in that manner.

The hazards would be doubled. That is, in the case of a ship running through the gates at the head of a lock, there would be almost certain destruction, not only of the locks, but of the ship below as well. It would be injudicious and unsafe to operate a lock canal in that manner, except possibly in some extreme emergency where it would be justifiable to incur that grave hazard in order to accomplish a very important end.

Senator KITTREDGE. Will a question interrupt you at that point?

Mr. BURR. No, sir.

Senator KITTREDGE. Suppose at some time it was desirable to have 25 ships of our Navy pass from the Atlantic to the Pacific, what would be the condition in reference to the operation of the locks and the time it would take for that fleet to pass through?

Mr. BURR. The effect would be a very slow passage of the fleet. The minority estimates, under ideal conditions that can never be attained, and which the members of that minority even do not claim will be maintained in the long run, that an interval of at least fifty minutes would have to elapse between two successive ships.

Senator KITTREDGE. Why is that?

Mr. BURR. Fifty minutes and thirty-nine seconds. It would require that length of time for one ship to get out of the way of another in this series of three locks—that is, it would not be possible to lock two ships through the canal any quicker, and through this triple lock, without that interval between them.

You would have to get one ship, you see, out of one lock and into the next before you could admit the second ship into the first lock, and that relative position between the two would have to be maintained through the lock. But, as a matter of fact, you could not put two ships through as quickly as that. There would be some little lost time. Instead of fifty minutes and forty seconds it would be at least an hour. Fifty minutes and forty seconds is but nine minutes and twenty seconds short of an hour. The interval, therefore, between two ships would be an hour. If all business of the canal were stopped in order to afford a clear passage for these naval ships, and if the

twin locks were used, it would take about thirteen hours, plus the sailing time between the locks, to get that fleet through.

That sailing time would not be less, probably, than eight hours—seven or eight hours—so that there would elapse twenty or twenty-one hours in which these vessels would be passing through the canal, one after the other, separated by intervals of one hour and incurring the hazard of two of these vessels at the same time being in this series of three locks.

We will assume that in the case of the sea-level canal all traffic would be suspended under precisely the same conditions. One vessel would then follow another immediately, and they would steam through uninterruptedly in seven to eight hours. It would take, therefore, very nearly three times as long to pass such a fleet through a lock canal as it would through the sea-level canal; and in the one case there would be comparative freedom from danger and in the other a grave hazard of crowding two ships at once into those locks and at the same time exposing them to the attack of some vicious enemy in that critical condition.

The question of the capacity of the lock canal follows, of course, immediately upon the consideration of this question of locks. It has been stated that the capacity of the lock canal, on the minority plan, is about 80,000,000 tons per year, with ample allowance of time for such repairs as might be required. A reference is made to experience with the St. Marys Falls lock to justify that high estimate of traffic capacity. It is worth while to consider in some detail the basis of that estimate. It is assumed for this purpose by the minority, and very properly, that in considering the maximum capacity of the canal it should be assumed that all vessels going one way should take one series of locks and all vessels going the other way the other series, the two series constituting the twin system of locks.

That is precisely what would be done and what should be done; but it is assumed that inasmuch as the three locks in the Gatun dam will consume the most time for passage of any single feature in the canal—greater, of course, than the two locks on the Pacific end—the period of time elapsing between consecutive ships in passing through those three locks will measure the capacity of the canal, because if the interval between two successive ships is small, you can keep ships going, provided they are there, in a regular procession; and the nearer any two adjacent ships are to each other intine the greater will be the number that enter the canal within twenty-four hours.

If two ships be supposed to pass through the Gatun locks as quickly as they can possibly be computed to move on purely theoretical grounds, with all conditions ideal, that period will be fifty minutes and thirty-nine seconds; that is to say, every fifty minutes and thirty-nine seconds a ship will enter the canal. So that, remembering that there may be this procession of ships passing in both directions the ideal capacity, the theoretical capacity of the canal will be determined by finding the number of minutes in a year and dividing that by 50.65 minutes, which is fifty minutes and thirty-nine seconds, and multiplying by 2, which gives 20,754 lockages, provided this whole procession is going day and night through the entire year.

It is impossible, of course, to have ships pass through the canal in any such ideal manner as that, and is so stated by the minority.

Judging from experience wholly with the St Marys Falls lock, they conclude that the number of practicable lockages will be two-thirds of that ideal, or, as they put it, "the coefficient of reduction is 68/100," which is practically two-thirds, and which would make 14,113 lockages.

Senator KITTREDGE. Do they make any allowance for the necessary time for repairs?

Mr. BURR. Not on that basis. I shall get to that, though, in a moment. There is no allowance made for anything on that basis except the incidental delays in getting to the lock and getting through it.

Assuming that each ship going through in this manner has a capacity of 5,000 tons net registry, the annual passage would be 70,560,000 tons.

Then, basing their argument upon further experience with the St. Marys Falls lock, which I will not read in detail, because it is not necessary to consume the time for that purpose, they assume that there will be fleets of ships passing through, so that each lockage will carry more than one, which is true, and that the aggregate of each lockage may be as much as 10,000 tons or more. So they conclude, on that basis, that the annual tonnage may reach 80,000,000 tons, with ample allowance of time for such repairs as might be required.

That is a very plausible statement, but I believe it is a very dangerous one to accept. I mean dangerous in that if the capacity of a lock canal is based upon such ideal conditions there will be serious disappointment in what it can do. In the first place, one-third of each year, approximately speaking, and very closely approximately speaking, the lock at the Soo is out of commission; that is, during four months of winter and the freezing weather at one end or the other of that period. That time is devoted to fundamental repairs and to putting the whole plant in order. These conclusions which I have just given you, and which can be verified by turning to pages 398 and 399 of the report, are based upon the eight months' working experience each year of the traffic at the Soo. There would be no such period on the Isthmus. The canal would always be in commission.

How much time should be taken out of the year to charge to necessary repairs of these great locks and their great machinery plants it is, of course, impossible to state definitely, but I should think that one-quarter of the whole time was not an excessive estimate. There must be some definite and material time given to that purpose.

Senator MORGAN. Is a quarter of the time requisite for repairing the locks at Sault Ste. Marie?

Mr. BURR. The locks there are out of commission, Senator, about four months in every year.

Senator MORGAN. I mean of the time they are in commission?

Mr. BURR. Oh, no, sir; when they are in commission the average may not be more than two or three days a month.

Senator MORGAN. Has it been that high even?

Mr. BURR. I think it has been higher, and it has been lower; but it is a small amount during the eight months. The repairs are all made during the winter—repairs to the locks and machinery. Three months may be too much or not enough; but there must be some time assigned to that. Suppose that instead of one-quarter it is one-sixth, if you please, to illustrate the point—and that is my only purpose. Sup-

pose we say that there would be five-sixths of the time in which the operation of these locks would correspond to the operating of the locks at the Soo during two-thirds of the time.

Senator MORGAN. But the twin locks, as proposed, would reduce that loss of time one-half.

Mr. BURR. No; I am speaking of each set of locks in itself. We are now considering, Senator, the maximum capacity of the canal when the traffic is very close to the limit.

Senator MORGAN. Very good.

Senator KITTREDGE. I understand you to say, Mr. Burr, that the capacity of the canal is limited, of course, by the capacity of the locks. Is that right?

Mr. BURR. It is limited by the capacity of the locks.

Senator KITTREDGE. That is the point you make?

Mr. BURR. Yes, sir; that is the point.

If, as I believe will be the case, it is first considered unsafe to rush ships through the locks in that way—two in a series at the same time—the interval, instead of being fifty minutes and thirty-nine seconds, will be eighty-four minutes and twelve seconds, or, say, an hour and a half. That alone would drop the traffic to about ten-seventeenths. Both the Comité Technique and the former Isthmian Canal Commission of 1899-1901, who made a very careful study of this same problem, concluded from such experience as existed at those dates that instead of taking sixty-eight one-hundredths as the factor five-tenths only should be taken, and that, I believe, is as high as it is safe to take it. We shall have six locks on this canal instead of one, of approximately 50 per cent greater lift for each lock, and with all the contingent elements of delays, which increase, not pro rata, but in a higher ratio, where there are a number of locks in series and a number of locks to pass through.

Senator MORGAN. What plan do you refer to as containing six locks?

Mr. BURR. The minority plan.

Senator KITTREDGE. That has six locks, three on either side?

Mr. BURR. Yes, sir; three on either side, the total number being six. So that we should have to multiply 10/17 by 25/34, which is 43/100, or, we will say, one-half. Those simple corrections, which are liable to be made and, in my judgment, will be made, would reduce the traffic from 70,560,000 to less than 35,000,000 tons.

Senator KITTREDGE. Do you know how that tonnage compares with that passing through the Suez Canal? Have you those figures in mind?

Mr. BURR. Yes, sir; I can turn to them right here. It is much greater. I think that the Suez traffic is about 19,000,000 tons, is it not, General?

General DAVIS. It has run nearly that in the last year; pretty close to that.

Senator MORGAN. Nineteen million?

Mr. BURR. Nineteen million tons.

General DAVIS. This last year.

Senator MORGAN. About one-half the capacity of the Soo?

General DAVIS. The Soo has run about 40,000,000 tons last year.

Mr. BURR. The minority, basing its conclusions upon the operations of the Soo lock, would make the time of passage through

this series of three locks eighty-four minutes and twelve seconds; that is, if I make no error; and if I do, I shall be very glad to be corrected by the minority. But, using their own figures, I get that result.

Senator MORGAN. May I ask right there whether any ships are excluded from the Soo now on account of their size?

Mr. BURR. I can not answer that question, Senator. There may be, on account of the draft, possibly. They are now enlarging it, deepening it. I am inclined to think that there have been a few such cases.

Senator MORGAN. Ships above that draft are excluded from the Soo—12 feet is it not?

Mr. BURR. I do not think there are any ships excluded from the Soo, because all the Lake ships, of course, would be built in view of the Soo locks.

Senator MORGAN. They would be excluded if they drew more than 12 feet, would they not?

Mr. BURR. Oh, no, sir; it is 20 or perhaps 21 feet over the sill—I have forgotten exactly what it is.

Senator MORGAN. It was formerly 12 feet?

Mr. BURR. Yes, sir; it has been increased a number of times. Of course, if there were any ships on the lake that required more water than would be afforded by the Soo lock on the sill they could not pass through it; but I do not think there is any such ship. In fact, there are not any such ships on the Lakes, because the Lake vessels are built for the purpose of meeting the provisions of the lake harbors and the Soo Canal. I will mention in passing—and I shall come back to that later—that a much larger and deeper lock is about to be built at the Soo.

Senator MORGAN. On the other side or on our side?

Mr. BURR. On our side.

On the basis, therefore, of the minority, the time of a ship passing the three locks in series would be eighty-four minutes and twelve seconds. Mr. J. W. Welcker, the Dutch member of the consulting board, who has had a most extended experience with large marine locks, makes a much more conservative estimate of the time required to pass this series of three locks. He would make the time, with a 1,000-foot lock (a little longer than if they were 900 feet) about one hundred and seventy-two minutes—nearly double. While it may be said that the minority estimate is based upon actual experience, it is equally true that Mr. Welcker's estimate is also based upon experience.

So you see that it is scarcely safe to take too sanguine a view of this quick passage of the Gatun locks. And even if we do accept the quick passage of the Gatun locks, the conditions of operation will, in all probability, be such as to cut its capacity from 70,000,000 down to less than half that, in order to avoid the unusual dangers which will accompany the operation of such a series of great locks. That estimate, even, is based upon conditions that can never exist. That is, it is based upon ships arriving at Colon or at Panama in series, on programme time, so that they can enter the lock immediately on their reaching the ends of the canal. Ships do not enter port in that way. They sometimes come at the right time to enter the lock immediately. They more frequently come in groups or fleets. Instead, therefore, of having this ideal adjustment of ships arriving

just at the time to go through, they will arrive in fleets or groups—remembering all the time that we are now considering the conditions of things which exist with the traffic capacity about at the limit of the provisions of the canal.

Suppose half a dozen ships—and under such conditions there might easily be more—should arrive at one end of the canal within a period of two or three hours. Only one at a time could enter the canal if the harbor were free on their arrival. The last of those ships would go through only after a delay of a considerable number of hours. And if other ships should arrive, as they probably would, while that group was waiting, those would be involved in a still greater delay, and so on. You would have a delay of hours upon hours, and it might be even days for some members of such an arriving fleet before they could get through the canal.

That is not an ideal or a theoretical condition. It is precisely the condition which the arrival of ships in ports ordinarily justifies. It is a condition which would inevitably exist if the number of vessels approaching this canal for accommodation anywhere near reached the limit of its capacity.

Senator MORGAN. Would not the same objection apply equally to a sea-level canal, where you had to pass a lock gate to get into it?

Mr. BURR. No; it would not, Senator. One-half of the time the tidal gates would be wide open, and the ships would simply pass in as fast as they arrived, one after the other, and during the extreme tides, when the lock would have to be used, it would be a single lock, like the St. Marys Falls, but with only half of the lift of that lock—that is, assuming that the tidal lock must necessarily be there, and that is what we do assume. So that there could be no such congestion with a sea-level canal, and that is, to my mind, one of the most important elements of the whole question.

It is impossible to avoid this congestion which I have just outlined when the traffic reaches any considerable magnitude. If there are only a few vessels coming now and then such conditions will be avoided. But it is simply impossible correctly to estimate a capacity for that lock canal which is even one-half of that assigned to it by the minority, taking into account the actual practical conditions which will inevitably exist when the traffic increases.

As a matter of fact, if you will imagine what will take place a little further you immediately reach a position where you find some ships that will never go through the canal but which will have to go around the lower end of South America to get to their destination, if they are passing from the Atlantic to the Pacific. Suppose you have a fleet of ships arriving within some one day, it being assumed that the ideal programme is that corresponding very nearly to the limit of the capacity of the canal, so that every eighty-four minutes, we will say, a ship goes into the lock.

The fleet of ships arrives, and it is followed by one or two at the ordinary intervals. Those ships pass in through the locks one after another, as soon as they can, and we will assume that, for the relief of the situation, there will be periods when no ships arrive, so that after a day or two or two or three days, if ships have been lying there that long, one of these void spaces occurs and they can all get through. That makes an equal balance. But suppose it does not occur that you have void spaces of considerable length, and then a

number of ships arriving are sufficient to more than make up for that vacant space, and suppose you have no void spaces after that time. You then get into such a confusion of congestion that some of those ships, theoretically—that is, figuring on the same basis which is used in the minority report—that some of those ships will never get through. That is, there must be a precise adjustment between the fleets and the subsequent void spaces in order to get them through the canal at all.

Of course there would be no such condition as a ship never getting through. The ship would get through, but others would have to wait in its place. There might be delays of a week or two, or two or three weeks, or even of a month, when the traffic reaches nearly the limit of capacity of the canal.

Senator MORGAN. But would not ships going, for instance, from Hongkong to Panama, as a matter of common practice, want rest and refreshment for their crews before passing through the canal and going on to Liverpool?

Mr. BURR. Many would. They would not stay there any longer than was necessary to accomplish their purpose; but they would want to stop for communication with the shore, to get their papers, to pay dues, and so on.

Senator MORGAN. To get fruits and market supplies, and so on?

Mr. BURR. Yes, sir.

Senator MORGAN. To get fresh food?

Mr. BURR. Yes; they would.

Senator MORGAN. That being the fact, that many would want to do that, would it not be desirable to have a lake inside the route in which they could make anchorage?

Mr. BURR. I should think it would be more desirable to have all that kind of business and those affairs attended to at the terminal ports rather than at any interior point, because, of course, the offices of the canal would be at one terminal or the other, and the markets for supplies would naturally grow up there.

Senator MORGAN. How about getting rid of barnacles, seaweed, etc., in fresh water?

Mr. BURR. I do not believe that any ship with a carload of freight would stop in any lake on the Isthmus to clean off its bottom.

Senator MORGAN. Even though it might increase its speed to the port of destination by two or three days?

Mr. BURR. There might be some extreme case of that kind, perhaps, but it would be phenomenal. I think that when a ship gets a cargo at one port and clears for another it is going to get to that other port and discharge its cargo and take on another one and earn its money just as rapidly as it can. Whenever its bottom becomes foul enough to require cleaning it will attend to that at some convenient port.

Senator MORGAN. How will it be with war ships that would have to go abroad to get into dry dock in order to be cleaned?

Mr. BURR. Well, of course a war ship is not subject to the same laws of business trips that merchant ships are. They might at times anchor in any convenient water, whether an interior lake or not.

Senator MORGAN. They would have to find the lake before they could anchor in it, would they not?

Mr. BURR. Yes; but they would anchor at the terminal ports.

Senator MORGAN. But that would be in salt water?

Mr. BURR. I did not understand your question. You mean for the purpose of cleaning their bottoms?

Senator MORGAN. That is exactly what I mean. I am speaking of vessels making trips from ocean to ocean.

Mr. BURR. I think they would go to a dock.

Senator MORGAN. How far do you think it would be preferable to go to a dock rather than to go into a lake of fresh water, that would clean them without any effort?

Mr. BURR. I am not a naval expert, but I know that the regular practice is not to go into fresh water, but to go into dock and clean up and make repairs.

Senator MORGAN. Is not the regular practice founded on the fact that the fresh water is not available, and they can not get into a lake?

Mr. BURR. But they can get into fresh water, Senator. There are many large rivers discharging into the sea that are perfectly accessible for ships of the greatest draft.

Senator MORGAN. But outside of the route of travel?

Mr. BURR. Some are and some are not. A war ship could go up the Hudson and get into fresh water very easily, but I have never heard of one resorting to that.

Senator MORGAN. Maybe the accommodations are not as good up the river as they are in New York for the naval officers. [Laughter.]

Mr. BURR. The attractions are greater at the city, I suppose. [Laughter.]

Senator MORGAN. But if they were compelled to take a route that had fresh water in it, they probably might loiter for a day or two or four or five days, or even a month, to clean themselves?

Mr. BURR. I think there would have to be some other reason than that before many of them would do it. I doubt very much whether that would be much of a consideration.

Senator MORGAN. We have had a good deal of testimony before this committee as to the great advantages of being able to clean a ship by putting it in a mass of fresh water. There has been a great deal of expert testimony on that point. I just wanted to ask you about it.

Senator TALIAFERRO. Do you suppose they would want to stop there in the Chagres country in the summer season and clean the ship's bottom?

Senator MORGAN. Well, I do not know about that. I suppose they could put mosquito bars all over the ship and keep the *Stegomyia* out. I suppose they could do that; yes. [Laughter.] It would be better, though, after all, to go through Lake Nicaragua, where there never was a case of yellow fever. [Laughter.]

Senator KITTREDGE. At some time before you leave this question of locks, Mr. Burr, I wish you would tell us about the decrease in size of the locks proposed by the minority over that as suggested by the full board. I do not know whether this is a convenient point or not.

Mr. BURR. Yes; that might just as well be taken up now as at any time. It is a short matter, only.

The law requires that this canal shall afford convenient accommodations for the largest ships afloat, or those which may be reasonably anticipated for the future. Of course it is a matter of judgment as to what that last provision may mean—what reasonable anticipation of the future is; but there are certain elements of the question which

are very plain. There are no ships afloat 800 feet long, but there are ships building 800 feet in length and 88-foot beam.

Senator MORGAN. Do you know where they are to run?

Mr. BURR. They are to run on the Cunard Line between New York and Liverpool. They are designed to run there. They are being built by the Cunard Line.

Senator MORGAN. Those big ships will be a mutual advantage to both countries?

Mr. BURR. I should say so.

Senator MORGAN. But if a big ship, 800 feet long, or one of the size of those Cunarders that are being projected, sails from Liverpool to Hongkong without breaking bulk, how would it be then?

Mr. BURR. I do not know that I understand your question.

Senator MORGAN. Well, suppose you load one of those Noah's arks at Liverpool with everything in the world that can be put into it—and 30 train loads can be loaded into one ship—and its destination is through this canal to Hongkong?

Mr. BURR. Yes.

Senator MORGAN. What advantage will the American people get out of that?

Mr. BURR. Well, if tolls are charged, they get the tolls, and if there is any collateral business done with the ship with American interests in the Zone, such as coaling, they will get the advantage of that. The indirect advantage of the stimulation of general commerce over the world is rather obscure and intangible, but still it is a real factor. Then, it is not unlikely, in fact, I should say that it would be practically certain, that if English interests should find it advisable to run great ships like that to oriental ports, American interests would not be far behind them.

Senator MORGAN. They would still be behind them, though, if not far behind, would they not?

Mr. BURR. I do not know whether they would or not. They might be ahead of them.

Senator MORGAN. They are behind them now in that, are they not?

Mr. BURR. They are now, but the present condition may not last.

Senator MORGAN. And they are very likely to stay behind. The small American ships would certainly be behind?

Mr. BURR. Yes.

Senator MORGAN. They would be very far behind?

Mr. BURR. There will always be a great deal of business for small ships. I think there is no doubt about that.

Senator MORGAN. In your investigations of this subject in regard to the size of locks, depth of canal, etc., have you ever taken into consideration the fact that Great Britain is not preparing the Suez Canal for the accommodation of these enormous ships?

Mr. BURR. Not yet; but I am impressed by the fact that ever since the Suez Canal was finished—and it was built as a private corporation—they have been doing nothing but enlarge it from that time to the present, and nobody knows when they will cease enlarging it. I think before they get through they will have accommodations for the 800-foot ships, or perhaps for larger vessels.

Senator MORGAN. I suppose that would depend upon whether we furnished a channel through which an 800-foot ship could go from Liverpool to Hongkong on a very much shorter line?

Mr. BURR. I do not know that it would, Senator. It might, but the dimensions of ships have been increasing steadily and rapidly for many years, and at the present time there is no evidence, so far as I know, to lead us to suppose that that increase is not to be maintained for some time in the future.

Senator MORGAN. That depends, does it not, upon the accumulation of capital in great navigation and ship-owning companies?

Mr. BURR. Doubtless.

Senator MORGAN. There is no doubt about that. Is there any necessity for providing accommodations for that class of people and cutting out the men or small companies that can not own those big ships?

Mr. BURR. I do not know, Senator, that that cuts out anybody. It is like all business. Those who are most favorably circumstanced to get the largest amount of business will get it, and others will get what they can.

Senator MORGAN. Is it necessary that we should provide ways and means by which the capitalists can combine in great companies for the purpose of killing off the smaller steamers?

Mr. BURR. Oh, no. I do not think that is the effect of such a waterway as this. In fact, it seems to me that a free and open waterway in any line of commerce, whether it is on this line or any other, will stimulate all lines of business, both those served by great appliances and those served by smaller ones.

Senator MORGAN. No sailing ship ever can pass through either a lock canal or a sea-level canal at Panama for the reason that it can not get away from there with its sails out through the doldrums. You admit that, do you not?

Mr. BURR. No, sir; I do not admit that it could not get away. There have been sailing vessels going in and out of the harbor of Panama for four hundred years.

Senator MORGAN. How many of them are going there now?

Mr. BURR. There are very few going anywhere now.

Senator MORGAN. There are plenty of them running up and down the coast and across the ocean in every direction.

Mr. BURR. Relatively a small number.

Senator MORGAN. Not relatively a small number. There is very close to a perfect equality in tonnage between sail and steam vessels to-day.

Mr. BURR. I know, in coastwise business.

Senator MORGAN. There are hydrographic surveys made by the Government covering a period of more than one hundred years that show that sailing ships can not afford to pass through the doldrums back and forth across the Pacific; that there is no wind. So that this Panama Canal will never carry a sailing ship through it that is destined, for instance, from Liverpool to Hongkong.

Mr. BURR. Well, I do not know about that, Senator. That may or may not be.

Senator MORGAN. Have you studied it?

Mr. BURR. Oh, yes; those questions have been before every commission that has considered this subject.

Senator MORGAN. Have they not deliberately resolved that it is better to sacrifice all the sailing ships and all their business than to miss having a canal through Panama?

Mr. BURR. I do not know of anyone that has done that.

Senator MORGAN. Have you not resolved that among the commissions that you have been on?

Mr. BURR. No, sir.

Senator MORGAN. Is not that the result of your action?

Mr. BURR. I do not believe that many sailing ships would ever use an isthmian canal wherever it might be placed. Although I think there would be one once in a while, it would have to be taken through with a tug, of course.

Senator MORGAN. Yes.

Mr. BURR. And it might have to be taken across the Bay of Panama by a tug, or it might not. It would depend upon circumstances. I have seen a great deal of wind about the city of Panama. I do not know how far down the bay it extends.

Senator MORGAN. Have you never investigated the proposition laid down in the hydrographic reports to the effect that a sailing ship can not pass through the doldrums with any possibility of a profitable voyage without being assisted from 200 to 600 miles into the ocean with a tug?

Mr. BURR. That may be.

Senator MORGAN. Is it not so?

Mr. BURR. Well, I do not know, Senator, as I should be willing to subscribe to so drastic an expression of it as that. The general features are in accordance with that statement.

Senator MORGAN. You are willing to go as far as the hydrographic surveys have proven the facts to exist, are you not?

Mr. BURR. Yes; certainly.

Senator MORGAN. Has your Commission or any commission that you have been on ever considered the question of cutting off the transportation power of the United States and excluding half of it or about half of it from the privileges of this canal that they are taxed to pay for?

Mr. BURR. That, Senator, is getting into a question that I should not hesitate to discuss if it were in line with these canal questions, but it does not seem to me to be so. There is no question about the fact that the vicinity of the Bay of Panama—in fact, the adjoining portions of the Pacific Ocean—are not attractive places for sailing ships, but I do not believe that the consideration of the disadvantages to sailing ships has ever had the slightest weight in deciding upon the Panama route. I believe that no sailing ships to speak of would ever use an isthmian canal, whether it was located at Nicaragua, Panama, or anywhere else.

Senator MORGAN. I would like you to state some reasons, if you have any, why no sailing ship would ever use the Nicaragua Canal.

Mr. BURR. Simply because it would be a very costly operation to take a ship through.

Senator MORGAN. For tugging?

Mr. BURR. Yes; and for tolls.

Senator MORGAN. From San Juan over to Brito?

Mr. BURR. It would.

Senator MORGAN. How much would it cost a ship?

Mr. BURR. I can not tell you exactly.

Senator MORGAN. Your reports show.

Mr. BURR. I am sorry, sir, that my memory has not sufficient capacity to enable me to remember the details of the figures.

Senator MORGAN. I will assume the responsibility of stating that it is very trifling, sir.

Going anywhere through there, direct across the ocean or up through that depression in the Cordilleras, across that lake, do not the trades blow perennially and powerfully as long as any trades blow?

Mr. BURR. There are strong winds blowing on the Lake of Nicaragua.

Senator MORGAN. And clear through as far as Hongkong—the trade winds?

Mr. BURR. You get fair winds in that part of the Pacific.

Senator MORGAN. Do you not get the whole force of the trade winds?

Mr. BURR. You get what winds there are.

Senator MORGAN. Well, they are the trade winds, are they not, just as certain as the tides?

Mr. BURR. The trade winds are not found off the coast of Nicaragua. The winds blow in the direction of the trades at times, but you lose the trades when you pass the Lake of Nicaragua, practically.

Senator MORGAN. Going which way?

Mr. BURR. Going from the Caribbean to the Pacific.

Senator MORGAN. To the Pacific?

Mr. BURR. Yes, sir.

Senator MORGAN. Well, I must leave you to the hydrographic surveys on that. I have no personal opinion about it, because I have never sailed through there.

Mr. BURR. I am speaking from my personal experience on the ground.

Senator MORGAN. I still have to confront you with the hydrographic surveys that show that the trades blow perennially through that funnel there, right out by Hawaii to the north end of the Philippines and to Hongkong.

Mr. BURR. Oh, yes, sir; there.

Senator MORGAN. Clear across the ocean. A man can set his sails there, put his helm in the right position, and never change his sails until he gets across, because he is carried over by the trades. Is not that a fact?

Mr. BURR. Well, when I was on the coast of Nicaragua, at Brito, there was a strong not quite southeast wind blowing, a strong wind up at Corinto, and, in fact, all down that coast on the Pacific side; but when we passed from Corinto to Panama there was practically no wind at all.

Senator MORGAN. From Corinto to Panama?

Mr. BURR. From Corinto to Panama.

Senator MORGAN. There was no wind blowing out from the coast?

Mr. BURR. No, sir. You practically lose the trades after you pass Lake Nicaragua in going from the Caribbean over to the Pacific.

Senator MORGAN. Where do they go? They blow perennially across the lake; then do they stop?

Mr. BURR. They do stop, as winds do here. We have a wind blowing in one part of the day and at night it ceases; and you have the same condition down there.

Senator MORGAN. If I am correct in my hypothesis—that the condition of the winds cuts off all the shipping through Lake Panama—would it not be a parallel case if these great steamers, 800 feet long or longer, should take the trade from the European coast to the Chinese coast in its effects upon the smaller classes of steamers?

Mr. BURR. I think that the effects upon the general prosperity of the country, Senator, should be considered, and not the effects upon some special portion. I do not believe, myself, that it would have that disadvantageous effect upon the smaller ships. I believe that there will always be a great trade and an increasing trade to be carried in the smaller vessels.

Senator MORGAN. You think that there will be a great and an increasing trade to be carried in the smaller vessels notwithstanding the competition of these immense vessels?

Mr. BURR. Notwithstanding the competition; yes.

Senator MORGAN. Notwithstanding the competition of these immense vessels that could carry as much as three or four of the smaller vessels?

Mr. BURR. I am aware of that, Senator, but their commercial field would be a different one from that of these great ships. We have large and small ships now, doing business in various directions, and I think we should always have them and always will have them.

Senator MORGAN. How about the coastwise trade of the United States that has to double the Horn now?

Mr. BURR. I think it would be very much benefited by this canal.

Senator MORGAN. Carrying it through by steamers?

Mr. BURR. Carrying it through by steamers.

Senator MORGAN. But a great deal of it is now conducted by sailing ships going around the Horn. Why not give them a chance?

Mr. BURR. They may have a chance. They may go through the canal if they wish to.

Senator MORGAN. But they can not get through.

Mr. BURR. They will have to be towed through by tugs, of course.

Senator MORGAN. And they will have to be towed out to sea from 200 to 600 miles, so that they can get a wind.

Mr. BURR. Very well.

Senator MORGAN. I was looking at the fairness of the treatment between two classes of people here that are supposed to have the same rights; but I suppose they have not got them.

Senator KITTREDGE. Mr. Burr, now tell us about the decreased size of the lock proposed by the minority.

Mr. BURR. The board decided unanimously, as I recall the vote—I think that was a unanimous vote, was it not, General?

General DAVIS. It was 2 to 11.

Mr. BURR (continuing). To adopt locks whose dimensions are 1,000 feet by 100 feet, usable length and width. While the vote was not unanimous, it was by a very large majority. The whole question of interests affected by the size of the locks was considered in connection with the past increase of ship dimensions, and it was felt that those dimensions were as small as should be adopted in view of the growth of ships during the past ten or fifteen years. It will be certainly from nine to ten years, and I believe it will be ten years from this time before the Panama Canal is opened to traffic.

Now, the increase in length of ships during the past ten years has been more than 200 feet. That, I believe, is a reasonable statement. It is not possible to state exactly how much the length of ships has increased year by year; but in looking back at the greatest ships afloat ten years ago and those which are now being built, the increase in length has been more than 200 feet. And, as I have already stated, there is no reason to believe that the rate of increase during the next ten years will be less than it has been during the past ten years.

Senator MORGAN. How long will the ships be then—a thousand feet long?

Mr. BURR. That would make ships approaching a thousand feet in length. It may be that that rate of increase will not be realized; but there is no reason whatever to suppose that it will not be very nearly realized. That being the case, a lock with a usable length of 900 feet will not be sufficient to accommodate the largest ships afloat at that time. The 1,000-foot length then will scarcely be sufficient.

Senator MORGAN. Let me ask you, right there, if a steamer a thousand feet in length would not find a great deal of trouble in getting around the curves in your Culebra cut?

Mr. BURR. I do not think so.

Senator MORGAN. You do not? Mr. Stevens seems to differ with you; but of course you have a right to your opinion.

Mr. BURR. I do not think that any ship even a thousand feet in length would have the slightest difficulty in getting around those curves. It would not go at the same rate of speed as a ship of half that length.

So that the size of lock which has been designed for this lock plan has a reasonable prospect before it of not being able to accommodate the ships afloat when it will be finished. I think, therefore, it is a lock of too small dimensions.

When we look back upon the history of canal building from the time of Telford and Brindley to the present day, one hundred and twenty-five years or more, we see one invariable procedure constantly repeated. That is the cutting down of summit levels, the increase in capacity of the canal prism, the increase in capacity of the locks. That has been the invariable history of every system of canal navigation in the world, I believe, practically, except some of those which were started in the early days of this country and went out of existence. But it has been so with all the European countries, from the small canals of England on to the present time. It has been so with the Suez Canal. It is so with the Manchester and the Kiel canals, and of course it has been markedly so with the Erie Canal. And now we see here proposed a feature of this great waterway so small that there is only one reasonable conclusion to be drawn from it—that it will be no sooner completed than that same process of reconstruction will immediately have to be begun.

That is not a strained view of the situation. It is in accordance with the strict facts of canal experience all over the world, and it has been so at the Soo. During the past forty years there has been nothing but a series of reconstruction of locks from the time the first lock was constructed there of any sensible dimensions; and with all the praise that has been given to the present Poe lock, for all its capacity, in all of which I join and accord fully, the United States

is to-day starting out to build a lock there with 75 per cent additional capacity to the Poe lock at the present time.

That is the history of the continuous reconstruction and reconstruction and reconstruction of the locks of the Soo; and that is not an exception.

Senator MORGAN. Is that increase in the size of the ships and the depth under water on the sills of the locks due to the increase of commerce?

Mr. BURR. It is due to the increase in demands for accommodation—yes; the increase of commerce.

Senator MORGAN. Have we not had full capacity in that canal to accommodate all the commerce that has passed through it for the last thirty-six or forty years?

Mr. BURR. We have certainly passed all the commerce that has sought it; but we would spend three times—yes, perhaps ten times—as much as has been spent to dig away that lock and have a free and open entrance into Lake Superior if it could possibly have been done. I do not suppose that the most ardent advocate of the Poe lock at the present time could deny that were it physically possible to take away every obstruction to and constriction of the lake commerce at the Soo, it would be taken away, leaving a free and open passage into Lake Superior; and in that case there would be more ships and more commerce than there is to-day passing that place.

Senator MORGAN. Are not the real facts at the Soo these—that the necessity for a greater lock is not so much to accommodate commerce that has not hitherto been accommodated as it is to enable the great capitalists to concentrate their money in building larger ships and cutting the smaller ones out of the Lakes?

Mr. BURR. Well, Senator, I do not take such a sinister view of the intentions of the business men of the Northwest. I do not believe that they desire to annihilate all business except their own. They are like all business men, I suppose; they desire to extend their business and make it as prosperous as possible.

Senator MORGAN. Have you known of any instance where combinations of capital are possible that they did not go into them for that very purpose?

Mr. BURR. Well, that is true.

Senator MORGAN. Yes; that is true.

Mr. BURR. Those are great questions which——

Senator MORGAN. If it is true in other businesses, it is equally true in controlling the commerce or navigation on the Lakes.

Mr. BURR. But whatever may be the details of the situation, the actual facts stand—that in all canal enterprises up to the present time the end, aim, and motive of the management has been to reduce obstructions to navigation and increase the capacities of the canals by eliminating locks wherever it is possible, and where it is not possible by increasing their size, and there has been a constant system of reconstruction going on at the Soo in accordance with that general result.

Senator MORGAN. Has not that been under the pressure of capital that demanded larger opportunities for monopolizing the trade?

Mr. BURR. Well, is not that simply saying, Senator, that business has increased and will increase, and that provision must be made for it? It may be that some features of business development are not

conducted in the most commendable way. That is undoubtedly so. Few things human are perfect. But it strikes me that what we have to consider in this view is, what has been the experience with canal constructions and canal enterprises heretofore as to capacities of the canals and the means of giving them additional freedom and greater accommodations for the traffic seeking them? And, to my mind, to constrict the capacity of this great canal by a small lock for the apparent purpose of paring down the cost of construction to a relatively small amount, is contrary to good public policy or good business judgment.

Senator MORGAN. That seems to be the prevailing opinion amongst all large money holders.

Mr. BURR. Well, I am not one of them, Senator. Civil engineers are not found in that company.

Senator MORGAN. With their present salaries, I do not see why they might not soon get into it. [Laughter.]

Senator KITTREDGE. You have not touched the question of the cost of these locks, as I recollect, Mr. Burr.

Mr. BURR. I can give you those figures.

The item of the Gatun locks, including excavation and back filling, is \$15,691,000.

The Pedro Miguel locks, including excavation and back filling, \$6,988,000.

The Sosa locks, including excavation and back filling, \$13,092,000.

Senator KITTREDGE. By "back filling" at Gatun do you mean the Gatun dam proper?

Mr. BURR. No.

Senator KITTREDGE. Is that amount included?

Mr. BURR. The Gatun locks are located in a hill, a natural hill. It would involve excavation into the hill and the rock which composes the subsurface material of the hill, and there would be some back filling—large quantities of back filling.

Senator KITTREDGE. As I recollect the figures you gave yesterday, the cost of the Gatun dam was, in round numbers, \$7,800,000. Is that right?

Mr. BURR. That is right. That is a separate item, in addition to the cost of the locks.

Senator KITTREDGE. And do the figures that you have given of the cost of the locks at Sosa Hill include the cost of the dams there?

Mr. BURR. No; the cost of the dams is a separate item, as I have already given it. These costs of the locks are separate from and in addition to the sums which I have named for the cost of the dams.

Senator KITTREDGE. Can you readily give the total estimated cost of the dam at Gatun, the Gatun locks, the locks at Pedro Miguel, the locks at Sosa Hill, and the three dams at La Boca, Sosa Hill, and from Ancon over by the railway? I have forgotten the name of that hill.

Mr. BURR. Yes. The Gatun dam and spillway is \$7,788,000. The three dams (that is, the La Boca, the Ancon-Sosa, and the Ancon-Corozal dams) amount to \$3,320,000. The Gatun locks amount to \$15,691,000. The Pedro Miguel locks amount to \$6,988,000; the Sosa locks, \$13,092,000. The total cost of those features is \$46,879,000.

Senator MORGAN. Dams and locks?

Mr. BURR. Dams and locks.

The CHAIRMAN. Mr. Burr, how large a ship can go through those locks?

Mr. BURR. A ship 900 feet long and with beam less than 95 feet. Those are the usable dimensions. Of course the total length of lock is much more, but the usable dimensions are 900 feet by 95 feet.

Have you any more questions on that point?

Senator KITTREDGE. None. At some convenient time I would like again to call your attention to this blueprint that has reached us during the recess, if you have finished with the locks. Have you?

Mr. BURR. Yes.

Senator KITTREDGE. I call your attention to this blueprint, and ask you whether this map was the original from which plate 12 was supposed to be taken?

Mr. BURR. That is my understanding—General Davis can tell you—that that is the original from which this plate is made. This, as I understand the situation, is the only map in Washington giving that information.

General DAVIS. Yes.

Senator KITTREDGE. In what respect do they differ?

Mr. BURR. I have not examined every item of information on it, but so far as I have examined this profile on line G H (and I have given it pretty careful examination) it shows practically everything except these items relating to the flow of water through the boring pipes from the various strata indicated.

Senator KITTREDGE. Then, from the blueprint, call to the attention of the committee and put in the record what developed from the borings in regard to water coming to the surface through these borings—at what depths, how close to the surface.

Mr. BURR. The material in a number of the borings was found to be sufficiently permeable to permit water to flow through it into and up the boring pipes from various depths, commencing about 32 feet below sea level and running down nearly to the greatest depth of 258 feet below mean tide—that is, water flowed from this material at various points in these various borings between those elevations.

Senator MORGAN. You mean that as the pipe was driven down the water would rise in it and pour over the top?

Mr. BURR. When it penetrated these various strata.

Senator MORGAN. Yes.

Senator KITTREDGE. Now tell us about the strata to which you have referred. What is the character of it?

Mr. BURR. It is a sandy or gravelly porous strata.

Senator KITTREDGE. And that is indicated upon the blueprint?

Mr. BURR. The character of material is indicated upon the blueprint.

Senator KITTREDGE. State from the blueprint what it is.

Mr. BURR. It is sand, gravel, and sometimes a mixture of sand and clay. That is the character.

Senator MORGAN. I suppose that the process of getting these borings is that they drive the pipe down until it strikes the rock and then insert their augers, their drills, and bore?

Mr. BURR. Yes; for the diamond drills, but for the jet borings they put down what we call a casing pipe, and then wash the material out with a smaller one.

Senator MORGAN. I understand the difference; but for the diamond

drills you drive your pipe until it strikes the rock, or until you strike material you suppose to be rock, and then you introduce the drill and bore?

Mr. BURR. And bore; yes.

Senator KITTREDGE. The statement was made by Mr. Stevens, and I think it is stated in the minority report, that one great advantage of the lock system is that ships can sail over a wide surface of water until they approach the Culebra cut. Am I correct in my statement?

Mr. BURR. It is the intention of the plan that in all except the deepest parts of the lakes ships should pursue perfectly definite courses, as shown on the maps, and through submerged channels. A ship can not sail at random anywhere in those lakes, except over comparatively small portions of them, where the water is very deep.

Senator KITTREDGE. In what manner was it expected that these channels would be marked out?

Mr. BURR. They would have to be buoyed, as submerged channels always are; and that is one feature I had intended to speak about. Perhaps I might as well make my statement now.

Senator KITTREDGE. Certainly.

Mr. BURR. Much has been made of the fact that these lake channels are wide—500 feet or 300 feet—and that consequently a vessel has much more freedom in them.

Senator MORGAN. Let me ask you there, are those wide channels that you speak of represented by the white area or by this shading of blue on that map?

Mr. BURR. They are represented by the limits of this portion of the white area.

Senator MORGAN. Yes.

Mr. BURR. But it is not in here [indicating]. In here we have very deep water.

Senator MORGAN. The shading of blue comes in to show that it is not navigable water, I suppose?

Mr. BURR. Well, no; I think not. I think that simply indicates the margin of the lake; that is all. I do not think the blue has any particular significance as to navigation.

Senator MORGAN. I notice there above Alhajuela that it is cut off entirely.

Mr. BURR. Well, it does cover shallow water—the margins are shallow. I do not know that the limit of the blue has any special significance, although it may have.

Senator MORGAN. I had supposed that the white area on that map was the area of water that was navigable for vessels with freedom, and that the blue area was an indication that the water would not be deep enough for that purpose.

Mr. BURR. It may be. Just let me read the legend. [After examining map.] It is stated here that the blue indicates "shallow water, with less depth than in adjacent canal." Well, that is about what it would be.

Senator MORGAN. Yes. That describes, then, the channel depth of the canal on those wide areas?

Mr. BURR. Yes. The white portion, it is stated here, indicates navigable water more than 41 feet deep for the Atlantic entrance and more than 45 feet deep from Gatun to the Pacific terminal, referred to mean tide and to mean lake levels.

A channel with submerged banks not rising to the surface of the water, so that they are invisible, is obviously in itself a very dangerous channel for navigation. Consequently its under-water limits must be buoyed. Even in that case the difficulties or dangers peculiar to such a channel are not altogether avoided unless the channel is very wide. It was necessary, therefore, in this plan, to make the submerged channels wide enough to lessen those dangers to navigation.

A much narrower channel would have equal safety to navigation, and perhaps greater safety, with its banks above the water so as to be visible to ships' pilots. Just what increased width for the submerged channels would be necessary to secure equal safety and freedom with the channel with banks visible I do not know that anyone can estimate; but I think that the least width that could be assigned to a submerged channel for that purpose would be double the width of a channel with visible banks. That accounts for the wide submerged channels in this plan. It is a wise provision; in fact, it would scarcely be a workable plan without these increased widths.

Those difficulties and dangers have been frequently encountered in the interlake navigation, in St. Marys River, Lake St. Clair, and Lake Huron. They have been frequently remarked upon, and while it is not definitely stated, in Appendix S, by Mr. Ripley, of the minority, as to the details of his reasons, there are one or two very significant passages. [Reading:]

For widths less than 300 feet smooth vertical sides should be provided—

He is speaking of channels in connection with that navigation, although making a general application of the experience there. He says:

For widths less than 300 feet, smooth vertical sides should be provided for the greater safety of ships; while for widths of 500 feet or more, submerged channels can have side slopes such as the material will naturally assume, or as will be left by the excavating machines.

The implication is that a channel with submerged banks ought to be about 500 feet wide, or more; and I think that it is a very judicious observation. That observation carries with it the significance which attaches to the danger of submerged banks.

Senator KITTREDGE. What about the relative curvature of the canal as proposed by each?

Mr. BURR. I will answer that, Senator, in just a minute, if you will excuse me.

Senator KITTREDGE. Certainly; I thought you had finished.

Mr. BURR. I was looking for some information.

In speaking of the navigation between the Lakes in channels large portions of which have submerged banks, though by no means all—perhaps not the majority of them, but still considerable portions have—he says:

In 1904 there were 34 groundings, principally during foggy weather.

The groundings would naturally be on the banks of the channel, and not in the center. [Reading:]

In 1905 the number of accidents was about one-third less. Each year the grounding of ships on the channel banks, or sinking in the channel on account of collisions, has temporarily interfered with navigation.

And so on. That is, the feature of submerged banks is a feature of difficulty and danger to navigation, and requires the most thorough buoying of the submerged banks, and any other provisions that may be necessary to secure immunity from the resulting damages.

You spoke, Senator, of the curvature.

Senator KITTREDGE. Yes. The relative curvature of the two plans, sea-level and lock.

Mr. BURR. I would like to say, in this connection, that in my judgment the curvature of either line is not a matter of any very great consequence; the amount of it is not sufficient to be serious. But inasmuch as the channel of the sea-level canal has been criticised as narrow—although it is the widest canal prism that has ever yet been proposed for similar navigation—as wide as the turning-out places of the Suez Canal—and crooked, I will refer briefly to the matter.

As a matter of fact the total curvature of the lock plan, as laid down on page 12 of the minority report, is 637° and $30'$.

Senator MORGAN. That is the total?

Mr. BURR. That is the total. The total curvature of the sea-level canal is 597° and $6'$. The difference is not great, but it is several per cent in favor of the sea-level canal.

Senator KITTREDGE. Do you know the curvature of the Suez Canal?

Mr. BURR. I do not. I can very easily get it.

Senator MORGAN. I wish you would state the smallest curvatures, the shortest radius in both canals.

Mr. BURR. The shortest radius in connection with the minority plan is a little difficult to determine, because it is a matter of computation, and is not shown. But taking the curves as they actually exist, the shortest radius of curvature is 1,700 feet. The shortest radius of curvature on the sea-level canal is 8,200 feet.

Senator MORGAN. Where is that 1,700 feet in the lock canal?

Mr. BURR. I do not recall, Senator, just where it was. I can very readily ascertain.

General DAVIS. Very near Bohio.

Mr. BURR. Very near Bohio. I presume it is right there [indicating].

Senator MORGAN. Where is that? Is that Bohio?

Mr. BURR. Near Bohio.

The total length of curve of the canal is much less in a lock canal than in a sea-level canal. It is 7.3 miles in the lock canal and 19.2 miles in the sea-level canal; but with the great radius of curvature of the sharpest curves in the sea-level canal that curvature is not a matter of great importance.

Much has also been said in connection with this matter of curvature to the effect that ships' pilots never like to sail their ships on curves, and in fact do not do it, but simply change their courses by ranges in such limited navigation as this.

The many years of experience on the Suez Canal, I think, may safely be referred to as settling that point. Ships are constantly sailed on curves in the Suez Canal. It is built for that purpose. They could not well sail in any other way; and even in the lock plan of the minority, the course is laid out on curves. It is laid out on curves simply because the pilot of a ship can not sail his ship in any other way. He has to change his course, and he can not change it

by rotation about a point. He has to sail his ship on a curve until his course is sufficiently changed to give him the next tangent. So that that criticism of sailing on curves being impracticable on a sea-level plan and avoided on the lock plan, is without any foundation whatever. Curves are contemplated on the lock plan, as shown by the minority's own plan.

Senator MORGAN. I do not understand that the minority says that it is impracticable, but that it is dangerous in the places where the walls are rock on either side.

Mr. BURR. I am not referring to the minority alone. Other parties have made observations of that character, but the minority have also done so. But, as a matter of fact, that feature is common to both plans; and I do not see how a pilot can sail a ship in any other way. He can not, as I said a moment ago, rotate his ship about a vertical axis in order to change his course. He keeps going, and that naturally brings him on a curve, and experience in the Suez Canal shows that that is not a matter of any inconvenience whatever to ships. They do it there constantly.

Mr. Quellennec, the French member of the board, who is the consulting engineer for the Suez Canal and has been for many years, made that explicit statement himself.

There is one other feature in connection with the Gatun Lake which bears upon the cost of maintenance of both plans, which, it seems to me, has not yet received the attention which it deserves, and that is the fact that all the sediment of every stream whatever found in this saddle of the Isthmus, through which the canal passes, is discharged into Gatun Lake, and the largest part of it so discharged as necessarily to silt up the channel to a large extent. I am aware that computations may be made which show that the total sediment brought down by the Chagres River, and possibly other streams, so far as that is known—and it is not very well known—will fill up Gatun Lake only after a long period of years. But that calculation is like a good many other plausible calculations on which conclusions are too abruptly based.

If the sediment were brought down and distributed uniformly over the entire lake, that would be true. But rivers do not bring down sediment in that way. Nothing is a matter of more common observation—in fact, it was stated by General Abbott himself during the sessions of the board—than that where a river comes down through a wide channel or a wide passage, many times in width the channel proper, the current will be concentrated along that channel—that is, along the deepest part of the moving water. That is constantly observed in the Mississippi River in times of flood, when miles of width of the valley are inundated. The main current, which is a rapid one, will be found over the channel of the river proper, and that is precisely what would be found here when the Chagres River is in flood. The rapid current, by far more rapid than at any other part of this lake, will be over the original channel of the Chagres River, because it is there deepest and the flow easiest—that is, the movement of the water meets with less resistance there—and consequently there the highest current is found.

The result will be that the greater part—not all, but the greater part—of the silt, the sediment which is brought down from the Upper Chagres in flood, will be carried down through this narrow

portion and dropped in the channel of the canal at least all the way to Tavernilla. In other words, instead of providing a great lake into which the silt can be brought and where it will be deposited without danger to the channel, it must be transported right along the canal line as it emerges into the wider portion of the lake, and will necessarily be deposited there, necessitating annual dredging to keep the channel clear. And I want you to observe particularly the narrow portion of this lake between Gamboa and Tavernilla. It is narrower there even than it is above Gamboa. There is a strip of canal prism which will be just as surely subject to deposition of large quantities of silt as this canal is excavated. It will be not a prohibitory expense at all, but it will be a large constant annual expense and trouble to get it out.

Senator MORGAN. You mean the current will pass on and the silt will flow off to the right and left of it?

Mr. BURR. That will be the result. It will take place to some extent right here, but it will also take place all the way down [indicating on map]. It does that in other places, and it will do it there.

Senator MORGAN. Well, that would have the same effect as the water passing down from the upper sources of supply through the sea-level canal; it would create currents, particularly in the part that is dredged out from the Bay of Limon up to, we will say, Obispo, or in that vicinity? That same disposition of water to pass in the channels where there is the least resistance would naturally create currents in the canal?

Mr. BURR. Yes.

Senator MORGAN. What would there be to resist that in a sea-level canal—the Chagres pouring in?

Mr. BURR. The same results will not take place with the sea-level plan, because, as I explained yesterday, no sediment is permitted to flow directly into the canal.

Senator MORGAN. I am not speaking of the sediment; I am talking about the currents that would interrupt navigation.

Mr. BURR. There are none in the sea-level plan.

Senator MORGAN. Would they not necessarily be there if you permit the Chagres River at its extreme high flood (as you would be obliged to do) to pass into the canal prism?

Mr. BURR. But, Senator, it does not pass into the canal prism at high floods. A limited quantity only is allowed to flow into the canal prism, which will never produce from the Chagres a greater current than about a mile and a quarter an hour, having no sensible effect upon navigation, and even that is not necessary. It be smaller still.

Senator KITTREDGE. As I recollect, you stated yesterday afternoon may be smaller still.

Mr. BURR. Into basins.

Senator KITTREDGE. And from those basins it flows over a weir into the canal?

Mr. BURR. Into the canal. It flows over in a quiet sheet. The sediment is all deposited, except an insensibly small amount, which may discolor the water, but all the great body of sediment, the great volume of sediment, is left in the sedimentation basins, the Gamboa Lake itself, of course, being the greatest sedimentation basin.

The same result, obviously, is likely to take place where any stream inflood flows down into these lakes. In other words, in the lock plan there is no provision whatever for preventing silt and sediment getting into the canal basin, and it will entail an item of cost for maintenance of a very considerable amount but which the sea-level plan is free from.

Senator KITTREDGE. You spoke yesterday of the banks in the Culbra cut slipping. To what extent is that true of the lock type?

Mr. BURR. What I think you refer to is the slipping clay—

Senator KITTREDGE. Yes.

Mr. BURR (continuing). At the top of the cut, and which can be readily controlled by either draining it or removing it. That feature is common to both plans. Perhaps a little less of it will have to be removed for the lock plan, and yet not much less, either. It is practically the same item for each plan. I do not think it is a serious matter, however; but what there is of it must be encountered in construction, whatever the type may be.

Senator MORGAN. As to the seriousness of that avalanche of slipping clay, there is a good deal of testimony in the record of this committee on former examinations to the effect that railroad tracks and railroad trains of cars, while the French were working it, were covered up and remain covered yet.

Mr. BURR. I have heard those same stories, Senator, but as much as I have been on the Isthmus—and, as I said yesterday, I have walked backward and forward, I believe, over that whole line I do not know how many times; perhaps a dozen times, eight or ten times anyhow, and talked with many who ought to know about that sort of thing—I have never yet been able to place that engulfed train of cars.

You will find plenty of them on tracks in the jungle, standing there now, which have never been washed away; but I do not believe that any such occurrence as that mentioned ever took place. It is quite possible—in fact, it is altogether probable—that in some places, more than one, perhaps a number of places, tracks have slipped down the side of a hill and thrown the train over, and it is altogether probable that a good many of those cars, or a number of those cars, were never taken up, so that they have been covered up in the dump. I myself have seen such a thing as that taking place—I did only last October—where some cars have gone off the dump. They were old French cars, not worth the trouble of picking them up, and they were allowed to lie there and be covered with mud; and I imagine that that has been the source of these statements.

Senator MORGAN. I suppose it must have been. Your description of it is bad enough, but they made it a little worse.

The CHAIRMAN. Mr. Burr, would you be able to finish to-morrow, say, from half past 10 to half past 12?

Mr. BURR. Oh, I think without doubt, Senator.

The CHAIRMAN. I thought you were tired, and perhaps you would rather that we adjourn now.

Mr. BURR. I am willing to go on longer.

Senator KITTREDGE. Before you leave us, Mr. Burr, I would like to have you tell us about the comparative time of the construction of the canal on each type, and also the question of comparative cost, and the question of maintenance and operation of each type.

Mr. BURR. That is, to-morrow morning?

Senator KITTREDGE. This afternoon or to-morrow morning.

Mr. BURR. I am perfectly willing to go on to any extent this afternoon.

Senator MORGAN. Let us go on and get as far as we can.

The CHAIRMAN. Let us go on a little while, then.

Senator KITTREDGE. We will be away to-morrow afternoon.

Mr. BURR. What item will you have taken up first, Senator?

Senator KITTREDGE. It does not matter to me. Suppose you take up the time of construction under each type.

Mr. BURR. The time of construction for the sea-level plan was discussed yesterday. I stated then that, in my judgment, the sea-level plan could be completed in ten years, and that if we add 25 per cent to that, as the majority has done, we certainly have a most abundant allowance of time.

There was one thing which I should have stated in this connection yesterday, which I did not. That estimate of time has been based upon an eight-hour day of labor, and with one shift per day only. I believe that when the time comes for the construction of this canal, over a considerable portion of the time required for its completion two shifts of men per day can be worked to great advantage; and I am not alone in that judgment. It is perfectly feasible, and in some respects it is a very advantageous arrangement. It gives the cool of the day for the greater part of the work, and it would double the daily product of operations and, obviously, shorten the time correspondingly. So that when I say that the sea-level plan can be completed, in my judgment, even within ten years, it is not an extravagant assertion; it is a well-founded one.

Senator KITTREDGE. In your estimate of ten years, do you estimate the feature you have just mentioned—double shifts?

Mr. BURR. No; that is based upon single shifts. But, I say, that if you add, as the majority has added, 25 per cent of ten years to itself, making twelve and one-half years, or from twelve to thirteen years, as the period (which is certainly a very generous allowance of time, one which, I think, is even too great), and if in addition to all that you work two shifts of laborers a large portion of the time, as it is perfectly feasible to do, the time will certainly be much decreased.

The same general observation applies to the construction of the lock plan; but there are some other elements in the estimate of time for the lock plan which do not make toward a shortening of the period of construction, but which make for its lengthening.

The work of digging in the great Culebra cut, which is the controlling feature of the sea-level plan, is the simplest kind of labor, the simplest labor operation that is ever done. It is the simplest that can be done—the simple digging and carrying away of the material.

The construction of the locks required in the lock plan, the building, transporting, and putting together of the machinery and locks, requires about the highest grade of skilled labor, on the contrary, which is ever employed in engineering construction. The employment of such skilled labor and such a skilled force is accompanied by many difficulties and great delays. All that machinery must, of course, be constructed here, just as locomotives are, sent down there in piecemeal, and put together under circumstances that are not by any means encouraging or calculated to expedite results.

That experience has already been found in connection with the locomotives and the steam shovels and other machinery which has been

sent down to the Isthmus, and I do not believe that it is feasible for anybody to predict with any great certainty how long a time it will take to excavate the foundations and prepare them for those great locks, send down all the cement and machinery and the various classes of materials, and put them together, under existing conditions on the Isthmus, and so complete the work. That kind of an estimate of time is involved in very great doubt. I think that nine years is about as scant a time as it would be permissible to estimate for that plan. I think it is more likely to run into ten or eleven. Indeed, I should expect, if the construction of this minority lock plan were undertaken, that it would be fortunate if the entire work were completed in less than ten years.

Senator TALIAFERRO. The minority estimated about six and a half.

Mr. BURR. Oh, no; the minority estimates nine, I think—from eight to nine.

Senator MORGAN. Mr. Burr, in speaking of the simplicity of this labor, do you refer to labor with machines or labor with picks and shovels and wheelbarrows?

Mr. BURR. I refer to the general work of excavating the Culebra cut and taking away the spoil. It is a fundamental principle, which I think must be accepted and acted upon by anyone who does any large amount of work on the Isthmus, to use power and machinery to the greatest possible extent and manual labor to the least possible extent.

Senator MORGAN. The work that you expect to be done there will be perhaps 80 per cent of it done with machinery?

Mr. BURR. I should say fully 80 per cent; perhaps more.

Senator MORGAN. It requires really intelligent labor, if not skilled labor, to work those machines, does it not?

Mr. BURR. Yes.

Senator MORGAN. So that in order to get the labor that you need there you would have to go to a pretty high class of operatives or workmen?

Mr. BURR. Yes; those must be mainly obtained from the United States.

Senator MORGAN. Now, that is really the point that I have been distressed about. I want to know whether, for such labor as is requisite to carry this canal through in a reasonable time (the time that you have been stating, for instance), we should go to Martinique or Jamaica and get negroes, or anywhere else, for a very low grade of work. Is it requisite?

Mr. BURR. I think, Senator, that it is. I think it may be requisite even to try the Japanese and Chinese coolies.

Senator MORGAN. They are very much more intelligent laborers than the negroes, I suppose.

Mr. BURR. I imagine they are. I have never had experience with them, but I imagine they are.

Senator MORGAN. But the higher the class of labor you can get there the quicker you will get it through?

Mr. BURR. Yes; of course the more efficient your labor force is the quicker it will be done.

Senator MORGAN. Yes. Do you think that the reliance upon Jamaica labor and Martinique labor and the like, such classifications of labor as you get from there, is a safe one for digging that canal, or had we better look somewhere for a higher grade of labor?

Mr. BURR. I think it is perfectly safe and good policy to get as much of that labor as you can; but I think this, Senator, that there must be on the Isthmus a surplusage of labor. Otherwise we will have interminable strikes and everything in the nature of a strike. Those laborers, of course, have never been accustomed to anything like a sense of moral obligation, or anything that approaches it, and they will work for two or three days or a week, until they can get money enough to live another week and drink what they want and then cease work until the money is gone.

Senator MORGAN. Let me ask this question then: You speak of strikes and they have been oftentimes mentioned here. You do not mean organized labor strikes or anything like that?

Mr. BURR. There have not been highly organized labor strikes yet, but doubtless there will be in time.

Senator MORGAN. Are these strikes that you refer to attributable to the individual action of the laborer or is it by combination and conspiracy?

Mr. BURR. It is by concerted action.

Senator MORGAN. Concerted action?

Mr. BURR. There is more or less organization, or has been on some occasions, but of course not to any such extent as we have here. But that will come a little later, you can depend upon it.

Senator MORGAN. It will come?

Mr. BURR. Surely.

Senator MORGAN. Now, there is the point. Is it not necessary to have some power of control there for the keeping of men at work in addition to a mere surplus of numbers to which you can appeal or from which you can draw as occasion may require?

Mr. BURR. Those people must be treated with absolute justice; that goes without saying.

Senator MORGAN. That is the first thing; yes.

Mr. BURR. That goes without saying. But after that it is my judgment that there has not been sufficient firmness in dealing with them. I think that we should get much better results if a firmer stand were taken.

Senator MORGAN. Then you want a strong governmental power there to treat them with that degree of firmness which is adequate to the situation?

Mr. BURR. I believe that would be wise.

Senator MORGAN. That is what I think. I will pass that over now. I just wanted to get it on the record as we went along.

Senator TALIAFERRO. The minority estimates that nine years will be required for the lock canal?

Mr. BURR. Yes.

Senator TALIAFERRO. And fifteen for the sea-level canal?

Mr. BURR. Yes; that is natural; but I differ most radically from the minority judgment. I do not believe that it is worth while to see too many lions in the way; and lions are at the basis of the fifteen-year estimate, and the twenty-year estimate, and the various other speculative estimates that we hear so much about. After having set forth a rational and reasonable programme of work, to have that met by no other argument than "Well, there is great uncertainty about all those elements of the question, and nobody can

tell whether they will come out right or not, and consequently the situation is too formidable to lend itself to exact analysis and exact treatment in that manner" is not conclusive.

The CHAIRMAN. That would apply to either plan, would it not, Mr. Burr?

Mr. BURR. It would apply to either.

Senator MORGAN. In your judgment, would there be any real difficulty in getting contractors to do that work by sections, or to take the entire job, and bond them up with a proper security for the completion of the work within the time required and in the way required?

Mr. BURR. I think not. I am not yet sure that it is the best way to treat all portions of the work by contract.

Senator MORGAN. Not every portion?

Mr. BURR. I am not certain yet; I might come to that conclusion later on.

Senator MORGAN. I will take it by the subdivisions that we have been referring to. I will take first the dredging from the seacoast into Bas Obispo.

Mr. BURR. Yes.

Senator MORGAN. Would it be proper and convenient, in your opinion, to have that done by contract?

Mr. BURR. I think that could be done very well by contract. I believe that the Government should do enough of that work itself to establish what would be a reasonable price to pay a contractor for it.

Senator MORGAN. They ought to know that before they go into it, ought they not?

Mr. BURR. But that can not be determined without actual trial. You have to investigate those things.

Senator MORGAN. But if you are making a contract you have to make it upon a unit basis.

Mr. BURR. I know; but let us establish first what will be a reasonable unit basis and then open it to competition and see whether any of these competitive prices are reasonable.

Senator MORGAN. I supposed from all that had been said here that that was what we had been working for for a year and a half—to try to find out what the unit price ought to be.

Mr. BURR. That was the intention, and that was one of the lines of work which was entered upon in the first year of this Commission's existence; but some portions of that have been suspended since then.

Senator MORGAN. Both the majority and the minority have agreed upon these unit prices for each description of work, as I understand it?

Mr. BURR. They have.

Senator MORGAN. That being settled—having the unit prices settled—why can they not be adopted in making up the specifications of contracts with contractors?

Mr. BURR. I can assure you, Senator, that if you are willing to give to contractors the unit prices which were adopted by the board for the purposes of its estimate, you will have no trouble in finding plenty of contractors to do that work.

Senator MORGAN. That is what I supposed.

Mr. BURR. I should be glad to take some contracts myself on that basis.

Senator MORGAN. Now, what are the exceptional parts of the work that you still think ought to be done by the Government?

Mr. BURR. I do not say that I think any large portion ought to be done by the Government, but I say that I have not yet come to a conclusion as to which would be the best. The Culebra cut, for instance, is one.

Senator TALIAFERRO. I think you stated this morning that you thought these unit prices had been fixed in some cases too high?

Mr. BURR. I did.

Senator MORGAN. And agreed to by the majority and minority as reasonable unit prices—very good. That being ascertained, I thought the basis was laid for entering upon a contractual system, unless there is some material objection to it which I have never yet discovered, and that we could go on upon these unit prices and make a contract, if that was considered to be the best way to do it.

Mr. BURR. I think you can do much better than those prices, Senator.

Senator MORGAN. And there would remain to the Government but inspection and supervision and direction in the matter of the executing of the work?

Mr. BURR. Yes.

Senator MORGAN. I was about to ask you whether the controlling works at Gamboa that you have described here would be a part of the work that the Government ought to keep under its own control?

Mr. BURR. I think those, too, could be done by contract to greater advantage.

Senator MORGAN. I do not see that there is anything left open, then, where the advantage would be in favor of having work done by the Government.

Mr. BURR. I think the Culebra cut, Senator, is the point about which there may yet be some reasonable doubt, although my mind is open. I have no positive judgment about that yet.

Senator MORGAN. I would suggest that it is very important that all doubts should be removed, if possible, from the proposition to do this work by contract. All doubts should be removed by study of the subjects, so that the Government can adopt either the present plan of working it out itself, or turn the work over to competent and well-bonded contractors to do it within a specified time and in a certain way.

Mr. BURR. I think it probably will result that the entire work can best be done by contract. I think that is probably what will be found.

Senator MORGAN. This committee will have to make a recommendation upon that subject, I judge; and I was merely trying to get the subject as clear as possible from all doubt and difficulty as to making contracts for completing this work. That is all I was trying to do.

Senator KITTREDGE. I move that the committee adjourn.

(The committee thereupon adjourned until to-morrow, Friday, March 9, 1906, at 10.30 o'clock a. m.)

ISTHMIAN CANAL.

COMMITTEE ON INTEROCEANIC CANALS,
UNITED STATES SENATE,
Washington, D. C., Friday, March 9, 1906.

The committee met at 10.30 o'clock a. m.

Present: Senators Millard (chairman), Kittredge, Dryden, Ankeny, Morgan, Taliaferro, and Simmons.

STATEMENT OF WILLIAM H. BURR, ESQ.—Continued.

Senator MORGAN. I would like to ask you, Mr. Burr, whether the Consulting Board agreed upon a unit value—a unit price—for Portland cement?

Mr. BURR. No; it agreed upon a unit price for concrete in place.

Senator MORGAN. What was the unit price? Do you remember?

Mr. BURR. Eight dollars per yard.

Senator MORGAN. Per cubic yard?

Mr. BURR. Per cubic yard; yes.

Senator MORGAN. What proportion of a cubic yard of concrete would consist of Portland cement?

Mr. BURR. You can say, roughly, a barrel to the yard.

Senator MORGAN. A barrel to the yard?

Mr. BURR. Yes. It would probably be a little more than that in some cases, but that is pretty near it.

Senator MORGAN. I suppose Portland cement made according to the usual chemical formula is the cement that would naturally be adopted by the engineers constructing the work?

Mr. BURR. Oh, without doubt—Portland cement and nothing else.

Senator MORGAN. That is a settled proposition?

Mr. BURR. Yes.

Senator MORGAN. It is constructed after a chemical formula that is unvarying, except, perhaps—

Mr. BURR. Oh, to a small extent.

Senator MORGAN. Four or 5 per cent?

Mr. BURR. Something of that sort; yes.

Senator MORGAN. The cubic measurement of the concrete, for instance, in the dam as it is proposed by the majority of the Board of Consulting Engineers at Gamboa would be a very large amount, would it not?

Mr. BURR. If it were built of concrete it would.

Senator MORGAN. Yes.

Mr. BURR. You must remember, Senator, that the majority did not make a definite recommendation as to the type of the Gamboa dam,

but said that it might be built either as concrete masonry or as a great earth dam with a masonry core.

Senator MORGAN. I supposed that all question as to the actual type of any dam or structure would be left open for consideration by the engineers.

Mr. BURR. Precisely.

Senator MORGAN. To be determined by them rather than by the act of Congress.

Mr. BURR. Precisely.

Senator MORGAN. Now, a still greater amount of Portland cement or of concrete would be necessary, I suppose, in the event of the construction of a dam at Gatun?

Mr. BURR. No; the plan of the Gatun dam—that is, of the dam proper—requires no cement. That is, it is simply a great mound of earth. But the locks, and the appurtenances to the locks, and the waste weir would, of course, involve great quantities of cement.

Senator MORGAN. Quite equal to the dam at Gamboa?

Mr. BURR. Probably more. I think that the total quantity of concrete that would be required by the minority plan would not be far from 3,500,000 cubic yards. I do not mention that as exact, but it is pretty close to it.

Senator MORGAN. Yes.

Mr. BURR. So that, roughly speaking, there would be about 3,500,000 barrels of cement required.

Senator MORGAN. That was all I wanted to know.

The CHAIRMAN. Is that at Gamboa alone?

Mr. BURR. No; that, Senator, is for the lock plan.

The CHAIRMAN. For the entire lock plan?

Mr. BURR. For the entire lock plan; yes.

The CHAIRMAN. I thought Senator Morgan was going to ask you a question there which I will ask you. Is Portland cement, whether you get it from one place or another, almost uniform in the matter of quality?

Mr. BURR. Very nearly so, from first-class manufacturers. The chemical formula varies somewhat; but in the main features it is the same.

The CHAIRMAN. Does it vary enough to make it a mistake to put in different kinds—that is, from different manufacturers?

Mr. BURR. You would not mix the cement from different manufacturers before using it in concrete. I do not know that there would be any special objection to that, but it would be an experiment, and there is no need of following that procedure.

The CHAIRMAN. If you were going to build a dam, say, at Gatun, or the locks at Gatun, you would use the same cement, would you, from the same manufacturer?

Mr. BURR. Not necessarily. You might use half a dozen different brands on that one work, but you would use each brand by itself.

The CHAIRMAN. The result would be all right?

Mr. BURR. The result would be all right; yes.

Senator MORGAN. But if you could get the entire supply of cement, for instance, for the Gatun dam, from one establishment, to be delivered by that establishment as required, for the sake of uniformity and for the sake of security in that uniformity of strength, it would be advantageous to have it, would it not?

Mr. BURR. Not materially so, Senator. There is not difference enough. All the cement used would be tested and its quality found and approved. There is not as much difference between brands of cement of first-class manufacturers as you are likely to get in the continued product of a single maker. It is not all absolutely uniform and mathematically unvarying. For instance, I had occasion to use cement last year from one of the oldest and most reliable firms in this country—a firm whose cement has been used by the million barrels about New York—and yet part of that cement would take its initial set, as we say—that is, its first degree of hardness—in an hour and a half, about as it ought to, and other parts in nine hours. That, of course, is abnormal. That raised a question as to the propriety of using the cement, but still that illustrates what you may get from even the best of makers.

Senator MORGAN. Such a variation of time in the initial setting of the cement would be a serious difficulty, would it not—a serious objection?

Mr. BURR. No; not unless it was for some special under-water work and where it was desirable to get the cement hardened as quickly as practicable.

Senator MORGAN. That is exactly what I refer to.

Mr. BURR. These locks, however, would not be built under water; they would be built in the dry.

Senator MORGAN. No; but the dams would be built under water?

Mr. BURR. No, no; all the work on the dams would be built in the dry also.

Senator MORGAN. In the dry?

Mr. BURR. In the dry, as we say—that is, it would be in great trenches in special inclosures where the work would be done in the open air, or, as we say, in the dry. Whatever water would come into these inclosures would be pumped out. No; none of that would be under-water work.

Senator MORGAN. Do you understand that in the construction of the Gatun dam, as proposed by the minority of the consulting engineers, that waste way of the controlling works would be built on dry surfaces?

Mr. BURR. In the dry; it would be built wholly in the dry.

Senator MORGAN. You would have to exclude all of that water?

Mr. BURR. Yes; the flow of the river must be controlled so that that end can be accomplished.

Senator MORGAN. By "the dry," you mean that there must not be any settled pool of water?

Mr. BURR. I mean that the fresh concrete that is put in, the fresh masonry, is not covered by water. There may be water around it. There may be a wet place; but the fresh masonry is not covered by water.

Senator MORGAN. And after it has set, then it may be covered?

Mr. BURR. Then it may be covered by water.

Senator MORGAN. And it gets harder as time elapses?

Mr. BURR. It gets harder as time elapses.

Senator MORGAN. Provided the cement is right?

Mr. BURR. Yes.

The CHAIRMAN. Do I understand that the cements that set in an hour and a half and those that set in nine hours are equally good, Mr. Burr?

Mr. BURR. That does not always hold, but it was so in that particular case; they were equally good.

Senator MORGAN. Was this cement that you speak of made in the Lehigh Valley?

Mr. BURR. It was made in the Lehigh Valley. It was Giant Cement—one of the most reliable brands made in America; a most excellent cement.

Senator MORGAN. In buying the Lehigh Valley cement in the work that you speak of, what was the average price per barrel—the fixed price per barrel?

Mr. BURR. I said it was last year; it was really year before last.

Senator MORGAN. Yes.

Mr. BURR. It was \$1.30 a barrel, delivered up in Connecticut, where I used it.

Senator MORGAN. \$1.30?

Mr. BURR. One dollar and thirty cents, in bags.

Senator MORGAN. Yes; in bags. They call it "barrels," but they do not use barrels?

Mr. BURR. No; there are four bags to a barrel. They will supply it in barrels, of course, but it is more economical to get it in bags.

Senator MORGAN. As a rule, how long will a bag of good Portland cement continue to be altogether the thing you want, as to atmospheric conditions and transportation by water and the like?

Mr. BURR. You can keep it indefinitely if you keep it dry. If you put it in a case that will keep it dry, that will keep the moisture out, I do not know why you should not be able to keep it indefinitely. Of course, under ordinary circumstances a little moisture finds its way in, but still there is no difficulty in keeping cement several months without special precautions, if you simply keep it in a dry place, covered up.

The CHAIRMAN. Have you ever used cement manufactured by the Association of American Portland Cement Manufacturers, of Philadelphia?

Mr. BURR. I imagine that that is an organization of manufacturers.

The CHAIRMAN. I suppose it is a combination of manufacturers.

Mr. BURR. Yes.

Senator MORGAN. There are quite a large number of manufacturers of cement in the United States, large and small, are there not?

Mr. BURR. A large number, and a large number of first-class makers, too. There is no better cement made in the world than is made in this country at the present time. There are a dozen different makers, perhaps more, the products of whose mills are first class.

Senator MORGAN. I notice that Mr. Ross mentioned vouchers that had been prepared for imported cement. Do you know anything about why that cement was imported?

Mr. BURR. I do not know of any other reason—I do not know of that particular case at all, but I presume that he can get foreign cement delivered at Panama at such a price as will compete successfully with American cement delivered there, and that is probably the reason for that particular incident.

Senator MORGAN. I suppose that after this canal is completed there will be a very great demand for cement on the western coast of America—North and South America?

Mr. BURR. Oh, I think so, without any question. The use of Portland cement is extending with amazing rapidity and has been for the last ten years—remarkably so.

Senator MORGAN. The coast that I speak of—the Pacific coast of America, commencing up at Alaska and going down to the Horn—is not productive in cements, it appears?

Mr. BURR. I do not know about that, Senator. It was not supposed twenty years ago that this country could afford raw materials for Portland cements. It was not thought practicable or possible. Of course now we have it on all sides, and it may turn out—and I think it is quite likely to turn out—in the same way on the Pacific coast, that materials will be found that are suitable for the production of excellent Portland cement.

Senator MORGAN. Would you expect to be able to get a supply of Portland cement from the Panama Zone?

Mr. BURR. I believe that there is raw material there, whether in the Zone or out of it, but within the limits of the Republic of Panama, which will make excellent Portland cement.

Senator MORGAN. But the transportation of the coal required to burn it would make it costly, would it not?

Mr. BURR. That may be a serious element. It may also be that coal will be found right on the ground. There are parties exploiting coal mines at present, you know, within a few miles of the canal line, and it is possible that that question of fuel will solve itself right on the spot.

Senator MORGAN. Is that the old Chiriqui development of coal, in the Chiriqui region?

Mr. BURR. It is up in the Chiriqui region, near Bocas del Toro. In fact, it is right in there; it is right adjacent to Bocas del Toro.

Senator MORGAN. That is the coal field the United States has been trying to get possession of for many years, you know.

Mr. BURR. Yes; but there is coal nearer to the Canal Zone than that. There is quite a considerable amount of coal up the Indio River, within, probably, 10 or 15 miles of the canal line; but whether it is good enough to have any commercial value has not yet been determined.

Senator MORGAN. That is to the west of the canal?

Mr. BURR. That is to the west of the canal.

Senator MORGAN. Is there any to the east that you have heard of?

Mr. BURR. Not that I have heard of; but, then, you know the mineral resources of that country have not been investigated.

Senator MORGAN. No; I suppose they have not been.

Mr. BURR. Not to any sensible extent; so that there is no telling what will be found there.

Senator MORGAN. I am afraid they will find gold there, and if they do they will tear the canal up to dig it out of the bosom of the earth. [Laughter.]

Senator KITTREDGE. As we were adjourning last night, Mr. Burr, as I recollect, you were talking of the question of the work being done by contract.

Mr. BURR. Yes.

Senator KITTREDGE. Had you completed what you wished to say on that subject?

Mr. BURR. Practically so. I stated that my conclusions had not yet taken very positive shape as to doing the Culebra work by contract, although I think that it will undoubtedly come around to that—that is, that it will be advisable to do even the Culebra work by contract. My only reason for putting the matter in that qualified way is that I should like to have seen much more work of investigation by the steam shovels, so as to determine a reasonable price for that work before the contracts are let.

Senator KITTREDGE. Do you mean in the wet season?

Mr. BURR. I mean both in the wet and dry seasons—right through the year. Even though those investigations might have been carried on under very disadvantageous conditions, I believe that we should have learned a great deal that is valuable. You will probably all remember that during the first year of the existence of the Commission a large amount of that investigation work was done and was productive of valuable results; but during the past six or eight months that work has been suspended entirely, so that we have ceased to get the benefit of that kind of an investigation. I believe that it will undoubtedly prove to be advantageous to do the whole work by contract.

Senator MORGAN. I was thinking about that after we had some talk about it yesterday evening. You divide (properly, as I suppose) the Culebra cut between Obispo and Miraflores. That is practically the Culebra cut?

Mr. BURR. That is practically the Culebra cut.

Senator MORGAN. Very good. Now, the great difficulty in that cut, if I understand it, is the transportation of the spoil?

Mr. BURR. It is a great transportation problem; that is the whole thing.

Senator MORGAN. Yes. Now, of course, as the Government owns the railroad and operates the railroad, it would have to supply transportation to the contractor. It could not give up the railroad and let him control it?

Mr. BURR. Oh, no.

Senator MORGAN. Very good. The Government, then, would have to supply transportation for the contractor in that particular part of the work?

Mr. BURR. That would probably be the way in which it would have to be done.

Senator MORGAN. Therefore that contract would be differentiated from, perhaps, any great part of the work by the fact that the Government would have to supply the transportation? That is what I supposed to be the difference between the Culebra cut, as we call it, and any other part of the construction.

Mr. BURR. Yes; that is a differentiating feature, and a great differentiating feature.

Senator MORGAN. Yes. Now, then, as a proposition that would be general in its application to the work of construction of that canal, the Government ought to retain the control of all the transportation by land?

Mr. BURR. I think it should.

Senator MORGAN. Yes. Of course if you come in with dredges from the Bay of Limon and proceed to dredge the canal up as far as

Gamboa, as far as you want to go with it, that transportation would be barge transportation and pipe-line transportation?

Mr. BURR. Entirely so.

Senator MORGAN. You would not have any occasion, or very little occasion, perhaps, for the use of the railroad in order to get rid of the spoil that might come out of that part of the canal between the Bay of Limon and, say, Obispo?

Mr. BURR. That might not hold. Senator, as far as Obispo. It certainly would hold as far as Bohio.

Senator MORGAN. I know it would.

Mr. BURR. Between Bohio and Obispo there would probably be a considerable amount of excavation in the dry, and that spoil would have to be carried away by rail.

Senator MORGAN. Then, if I understand you, the control of the railroad for the transportation of all the spoil that has to be transported by rail would be necessarily retained in the hands of the Government?

Mr. BURR. That is my judgment.

Senator MORGAN. Yes; and that would harmonize with the transportation for commercial purposes?

Mr. BURR. Yes.

Senator DRYDEN. You may have explained, perhaps, when I was not here, whether it is your idea that this canal shall be divided up into sections for contract work?

Mr. BURR. I think it should be, Senator.

Senator DRYDEN. Have you formed an opinion as to how many divisions there should be?

Mr. BURR. I do not wish to express myself positively upon that matter, but I should say generally that there will be a dredging section from Colon (including, perhaps, the harbor work) to Bohio. That is all dredging work of a practically uniform character. The breakwaters in Colon Harbor or Cristobal Harbor, whichever you choose to call it, might or might not be by separate contract. Then there would also be a section from Miraflores to the Pacific Ocean which could be done by a separate contract. The Gamboa dam—I am now speaking of a sea-level plan—would, I think, be a separate section or contract. The Culebra cut would probably be another, and the work from Bohio up to Obispo possibly another—some such division as that.

Senator DRYDEN. That would be, with a sea-level plan, something like seven different contracts?

Mr. BURR. Something like that; yes.

Senator MORGAN. Each of these divisions you speak of has its own characteristics that will have to be provided for in specifications?

Mr. BURR. Precisely.

Senator TALIAFERRO. Except the two dredging contracts—the one from the Atlantic and the other from the Pacific ends?

Mr. BURR. They might go under one contract. In fact, the same parties might take two of these sections, possibly; but I mean that would be approximately the general division of things.

Senator TALIAFERRO. If the canal were to be built by contract, would you not consider it advisable to get as much of the work under the management of one contractor as possible?

Mr. BURR. I think that as a general principle that would be advisable, but just how far that should be carried in covering two or more of these approximate sections which I have mentioned would be a matter to be determined when it arose; that is, I should not like to put myself in the position of making a very positive statement as to those details at this stage of the matter.

Senator KITTREDGE. Undoubtedly if the work is to be done by contract, bids would be invited upon each section and the entire work?

Mr. BURR. Probably.

Senator KITTREDGE. Or a different combination of sections?

Mr. BURR. Yes.

Senator KITTREDGE. Would it be done in that way?

Mr. BURR. It could be done in that way and probably would be, or in some similar way.

Senator DRYDEN. In many contracts where different contractors are interested and contract for the different parts of the construction one contractor may either help or hinder very materially the work of another contractor. I am speaking now of the general, ordinary contract work. Would that be applicable in this work?

Mr. BURR. It might be.

Senator TALIAFERRO. Would it not be peculiarly applicable in this work, in view of the fact that we have only the one railroad there, the Government line, and in view of the difficulty about the labor conditions on the Isthmus?

Mr. BURR. If the Government controlled the railroad—and that is one reason why it should, in my judgment—that fact would obviate a good deal of this intercontract friction which would or might otherwise take place. But, for instance, if the Gamboa dam should be a great earth mound with a concrete core, and that earth should be taken from the Culebra cut and there should be two different contractors for those two portions of the work, unless the specifications were carefully drawn and the whole management efficient you can readily see that those two contractors might have considerable friction about various points in the progress of their works. But under efficient management it might be practically eliminated.

Senator TALIAFERRO. What would be the length of the haul from the Culebra cut to the Gamboa dam?

Mr. BURR. It would depend upon the portion of the Culebra cut from which you took the material to the bank. From Gamboa to the highest point of Culebra Hill is about 6 miles, along the canal line; but from Gamboa to the beginning of the deepest part, at Las Cascadas, is only 2 miles. It would not be a long haul.

Senator MORGAN. Is that at Obispo?

Mr. BURR. Las Cascadas is near Obispo. Obispo is about halfway between Las Cascadas and Gamboa.

Senator MORGAN. The proposition grows upon me that you seemed to subscribe to yesterday—that in any and every event the United States will require the exercise of its strongest and even its most arbitrary powers down there to control situations, and particularly so if you put it in the hands of contractors.

Mr. BURR. I do not know that I should want to subscribe at once to the expression "the most arbitrary power," but there certainly must be a firm control of the situation.

Senator MORGAN. I mean a power least controlled by writs of habeas corpus and lawsuits of different kinds, and interventions, appeals, etc. I will say "summary" instead of "arbitrary."

Mr. BURR. I have no hesitation in saying that there must be a very firm control of things down there; but as to the details of procedure in order to secure that control I should prefer not to express myself very positively.

Senator MORGAN. But you are satisfied that the power ought to be there to control it?*

Mr. BURR. There should be a firm control of the whole situation; there is no question about that, in my judgment.

Senator TALIAFERRO. Mr. Burr, you addressed yourself yesterday with some particularity to the time it would require to put a ship through this lock canal. Did you state, or will you state now, concisely, what time you estimate it would take the ordinary ship to pass through the seal-level canal from ocean to ocean?

Mr. BURR. It would depend somewhat on the size of the vessel; in fact, it would depend a great deal on the size of the vessel.

A ship 800 feet long, we will say, such as is now building (which, of course, is an enormous vessel, and larger than any now afloat), would require probably ten hours, with the prism proposed in the majority report. A ship, say, of 5,000 tons burden, such as at present the New York and Hawaiian Steamship Company are running between New York and San Francisco and New York and Hawaii, would pass through that canal in probably six hours—six or seven. Ships have passed through the Suez Canal (and that, after all, is the only practical test which we have at the present time as to such matters), a canal with a materially smaller prism, at the rate of about 6 miles an hour, when their wetted section has been almost one-third of the wetted section of the canal prism; whereas the majority has based its considerations of passing through the sea-level canal on the wetted cross section of a ship being not more than one-fourth of the wetted section of the canal prism.

Those are facts of experience on the Suez Canal with ships up to nearly 600 feet in length—not quite. I think they have passed ships up to 560 feet in length, but, so far as I now recall, not up to 600 feet.

Senator MORGAN. Do they run day and night?

Mr. BURR. They run day and night.

Senator KITTREDGE. How about the passage of the same ship through the lock canal?

Mr. BURR. That brings up the same question which I touched upon yesterday. It is essentially impossible to estimate, under practical conditions, the time required to pass such a ship through the lock canal on the plan of the minority. We may assume, as is assumed in the minority report, that the ship arrives at the terminal port when the condition is exactly right for its immediate entrance into the canal; that all of the enormous machinery of these six locks is working to perfection; that the ship will move promptly to its place in the lock; that the gates behind it will be closed without a hitch and that those in front of it will be opened without a hitch; that the filling and emptying of the locks will all occur promptly; that everything in this train of appliances and its management and con-

trol shall fit exactly into each other—that is, with absolutely ideal conditions you might get such a ship through the lock canal in perhaps eight to nine hours.

But when you take the average time in the long run, month in and month out, with ships arriving at the terminal harbors practically in fleets, the last of a fleet of ships would naturally have to wait until all the others had gone into the locks and passed on their way.

Senator TALIAFERRO. Mr. Burr, let me interrupt you there a moment. Does that estimate of time refer to the 800-foot ship—the ship 800 feet long—or to the average ship?

Mr. BURR. I am now speaking of the average ship, 400 or 500 feet only in length, or less, if you please.

Senator TALIAFERRO. So that the difference of time between the sea-level and the lock canal for the passage of the average sized ships would be what?

Mr. BURR. I am getting at that as nearly as I can. The last of those half dozen ships, we will say, would probably have to wait at the terminal harbor some eight or nine or ten hours, even if everything worked to perfection—and it never does with human things. But suppose it does work to perfection, then the average wait or delay of those ships at the terminal would be perhaps four hours. It might easily be more than that, but say it is only four hours. Now, add that to the time required in actual ideal passage, and you would get from twelve to thirteen hours—materially more than would be required to pass through the sea-level canal.

If you add to that (which you must add if you are to deal with things as they actually are and not theoretically) the hitches of machinery and lock gates and the little delays of all kinds that will occur in the operation of such trains of mechanism and so many heavy moving masses, with an occasional breakdown or accident, either to the ship or to the lock or to something else, I doubt very much whether the average through the year of the time of passage of a ship through the lock canal will be less than twice that required to pass a ship through the sea-level canal. Of course that is not an exact computation, but it is as near as can be made.

Senator KITTREDGE. Right at that point, Mr. Burr, let me suggest that I notice that in the minority report a comparison is made with conditions at the Soo lock. Have you any comment to make upon that suggestion or statement?

Mr. BURR. I am very glad that you have asked that question, Senator, for I had intended to touch upon that matter before and it has slipped my mind.

Any conclusion as to the time of passing through the canal on this lock plan with six great locks, three of them being in series at the Gatun dam, based upon the experience at the Soo, with one lock only, and that with only about two-thirds the lift of any one of these, will be utterly misleading, and I want to say that with all earnestness and emphasis, because that fact is frequently overlooked. The majority has stated it, but it has not received the attention to which its actual importance entitles it.

The passage of traffic through the St. Marys River and the Soo

lock—because, strictly speaking, there is no canal there; the canal is only a mile and three-fifths long, and it is practically an approach to the lock and nothing else—is made under conditions radically different from those which will be found at the Isthmus for all time. All the ships that pass the Soo lock pass it practically on schedule time. That service has been aptly termed a ferry. They are ships running between the Lake ports, from the Lake ports this side of the Soo to Lake ports the other side, or vice versa. There is a regular procession of vessels—that is what it amounts to—with fixed intervals between them, or, as I said a few moments ago, practically running on schedule time. It is precisely like a railroad schedule. That is not an exaggeration. It is simply a statement of the facts as they are. Now, that is ideal for that purpose, so that it is rare that two or three ships will conflict with each other under such circumstances.

Anyone who is familiar with ocean navigation, I think, in any port of the world, will bear me out in saying that no such regularity of traffic is thinkable.

Senator KITTREDGE. You are now speaking of the lock plan?

Mr. BURR. I am now speaking of the traffic which will be tributary to the isthmian canal. I have just shown with what schedule regularity ships approach and pass through the Soo lock, and I am now contrasting it with the conditions which will exist at the Isthmus.

Of course no such regularity of schedule as that is possible. The ships in the interior lakes pass over trips of a few hundred miles at most between ports. The ships that will pass through the isthmian canal are engaged in ocean navigation. They come from ports all over the world, going to ports all over other parts of the world. French, German, Italian, English ships are going to the Orient, we will say, or American ships are leaving the Atlantic coast to go to the Orient or the Pacific coast of the United States or in other directions; and it is the experience of every port in the world (it must necessarily be so) that there is no regularity in the arrival of ships at a terminal canal port under such circumstances. There may be a day or two with scarcely a ship and then a day with a dozen. It is very misleading to state any conclusions as to time of passage, or, in fact, any other conclusions as to the operation of the lock plan at the Isthmus, on the experience of the Soo lock. This bunching of ships on the Isthmus, or arriving in fleets, as I stated yesterday, if the traffic ever becomes great, as, in my judgment, it certainly will, would result in most confused congestion with a lock canal. In fact, if you attempt to analyze it on a theoretical basis, you will find that some ships will never get through the canal.

The CHAIRMAN. Mr. Burr, have you gone over the statement made by the chief engineer in regard to that particular?

Mr. BURR. I have.

The CHAIRMAN. Will you give us your opinion as to his statement?

Mr. BURR. You mean—

The CHAIRMAN. As to the time he thinks it will take, in his letter, generally, in regard to that.

Mr. BURR. He takes the same position as the minority.

The CHAIRMAN. I understood you were going to talk to us this morning in reference to Mr. Stevens's letter, were you not?

Mr. BURR. Yes; and I shall, in detail; but as to this particular point regarding the time of passage through the canal, his position is the same as that of the minority, and my criticisms of the minority's position apply directly to his observations. His statement to the effect that ships can pass through the lock canal quicker and more safely than through a sea-level canal is, in my judgment, without any foundation whatever in actual experience.

Senator MORGAN. Mr. Burr, you have mentioned your opinion that the traffic through the canal will become very great, very much greater than is now supposed by people usually, I take it?

Mr. BURR. I believe it will become a large traffic.

Senator MORGAN. The traffic through the Suez Canal has increased very rapidly, has it not?

Mr. BURR. It has.

Senator MORGAN. The traffic through the Soo Canal has increased with still more wonderful rapidity?

Mr. BURR. Still more wonderful rapidity.

Senator MORGAN. Yes; so that the tendency of commercial intercourse and interchange has been very active and is getting more and more so every day?

Mr. BURR. It appears to be.

Senator MORGAN. I suppose that no one could now estimate what amount of commerce would await transportation through the Panama Canal at the time of its being completed either on the sea-level plan or the lock plan? No one can make any estimate as to that?

Mr. BURR. No; nothing like a demonstrable conclusion. The Commission of 1899-1901 made as careful a study of that question as could be made, and it did not express any positive opinion, but thought that there might be seven or eight million tons, or something of that sort.

Senator MORGAN. And there are just as apt to be seventeen or eighteen million?

Mr. BURR. Yes; or, the first year, less.

Senator MORGAN. So that the capacity of the canal is limited to a certain amount of tonnage passing through under the best system of management. It is a limited capacity.

Mr. BURR. The lock canal is of limited capacity; but a sea-level canal—of course its capacity is limited, too, but its limit is so high that it is very great.

Senator MORGAN. I had supposed that the sea gate on the Panama side was a limit of a very important character.

Mr. BURR. I do not think that it is a very serious limit, Senator, for the reason that if at one stage of the tide there were half a dozen ships waiting to get into the canal—just as I have supposed already—within that tide there would come a period of a considerable number of hours when the gates would be wide open, and the whole could go through.

Senator MORGAN. If, instead of seven or eight millions of tons—which have been the basis of calculation passing through annually—there should be seventeen or eighteen million tons, then you would think that the canal was about to its limit, would you not?

Mr. BURR. No; I think that the lock canal would pass more than that. There would be great inconvenience at times, but I think it

might pass, perhaps, thirty or thirty-five millions. But you can not estimate that with any reliability.

Senator MORGAN. The Soo Canal already passes 36,000,000 annually in half the year, does it not?

Mr. BURR. At that rate?

Senator MORGAN. Yes.

Mr. BURR. At that rate?

Senator MORGAN. Is that only at the rate of 36,000,000?

Mr. BURR. It operates approximately only eight months in the year, but it is at that rate.

Senator MORGAN. But the 36,000,000 actually went through it last year, did they not?

Mr. BURR. I think it is not quite so much as that.

Senator MORGAN. Well, thirty-five or thirty-six—close to it.

Mr. BURR. As I recall it—I may be mistaken, but as I recall it—the rate during the eight months of its use was at about 39,000,000 tons in twelve months.

Senator MORGAN. Yes.

Mr. BURR. But I may be mistaken about that. It was a large quantity.

Senator MORGAN. It is a tremendous quantity.

Mr. BURR. It is a tremendous traffic; but you must remember that there is only a single lock there, Senator.

Senator MORGAN. And that is supplemented by the British locks in sight of it on the British side of the waters?

Mr. BURR. It is.

Senator MORGAN. And they carry almost an equivalent amount, do they not?

Mr. BURR. No; nowhere near as much. The bulk of the traffic passes on this side.

Senator MORGAN. But it is still supplemented by at least two great trunk lines of railway that haul much of the stuff that would go through the canal if there was no other means of transportation; so that the increase of commerce at that center or along that line has been simply tremendous and almost unaccountable.

The point I want to get at is this: I will state as a predicate for it that my view of the situation, and my doctrine, if you please to call it such, is this—that no government in the world—not even the local governments on that Isthmus—shall be permitted to stand in front of the United States as to the control of any canal cut anywhere through the isthmian region. That is my predicate. Therefore the United States, if it follows out its own declarations and its own indispensable national policy, must take charge of any canal that is carried through there. That does not apply to railroads, but to canals, and very properly; because a railroad can not get out to sea, while a ship passing through a canal can, and can go to the uttermost parts of the earth.

It is further my impression and my conviction that by the time we get the Panama Canal built on either plan we will find more commerce there than one canal can carry, and that the necessary resort will be to the canal through Nicaragua, and then that "the stone which the builders have rejected will become the chief stone of the corner." That is my notion about it. I do not hesitate at all to

speak of it and to state it, because I look forward to it with great hopefulness.

Do you conceive that there may be a necessity, that it is quite reasonable to contemplate a necessity, for having an additional line of canal ready, not only to accommodate the excessive commerce that will present itself for passing through the canal at Panama, but also to accommodate the ships that are sailed by the winds that belong to American commerce? Do you conceive that that is a probability?

Mr. BURR. Senator, you have constructed in a very skillful and graceful way the strongest argument that I could possibly hope for in favor of the sea-level canal at Panama.

Senator MORGAN. I do not think it is an argument against it, by any means.

Mr. BURR. Because a sea-level canal has practically unlimited capacity, and if the canal as completed should be found in any way or for any purpose inadequate for the traffic of future years—as it probably would be at some future time, not so very remote in the future, either—its enlargement to accommodate that increased traffic would be simplicity itself. It could be done economically; it could be done rapidly and most effectively.

Senator MORGAN. Now, will you please state how that can be done, because that is an exceedingly interesting question?

Mr. BURR. It can be done by simply excavating material on one side or on both sides, if you wish—all that part above the water surface in the canal in the dry and the small portion remaining under water.

Senator MORGAN. Right there, if you will allow me, I want to ask you a question. Do you adhere to the same plan in regard to the sea-level canal that was suggested in regard to the plan of the Walker Commission, of putting walls on either side of that canal?

Mr. BURR. As a result of our experience on the Isthmus and of my own personal experience during the past six years—for I have had opportunity to observe that matter closely—I believe that those revetment walls are absolutely unnecessary.

Senator MORGAN. You exclude them, then, from your calculations?

Mr. BURR. I exclude them from my calculations.

Senator MORGAN. I wanted to know how that was.

Mr. BURR. There may be a few soft spots here and there; but that would be a matter of very small moment and is included in the 20 per cent for contingencies.

Senator MORGAN. So that in the enlargement of your canal you would not have to take out any walls?

Mr. BURR. You would take out no walls, reconstruct no expensive masonry; you would simply dig and cart away the material.

Senator TALIAFERRO. And the work, Mr. Burr, could really be done more economically, could it not, by the use of the canal than by digging out the greater width at one time?

Mr. BURR. Much more so. In fact, the whole operation would be one of extreme simplicity and economy; and it would interfere not at all, or at any rate not sensibly, with the navigation through the Isthmus at the time.

Senator MORGAN. So that if it became necessary, in order to accommodate commerce, to enlarge the sea-level canal, you would prefer to do that rather than to build a canal through Nicaragua?

Mr. BURR. I should, Senator; although I have very pleasant recollections of Nicaragua and great admiration for the natural beauties of that route.

Senator MORGAN. And you made a strong recommendation in favor of its practicability on two occasions, once under oath, did you not?

Mr. BURR. I think not on two occasions. We reported first favorably to the Nicaragua route, because it was impossible to get a reasonable proposition from the New Panama Canal Company.

Senator MORGAN. No; that was before you had made up your mind about that, I take it—before you had ever heard of a proposition from the Panama Canal Company.

Mr. BURR. I do not recall what you have reference to, Senator.

Senator MORGAN. I have reference to the fact that you had stated—every one of the Commissioners, if I remember correctly, had stated—under oath before this committee that that plan of the canal through Nicaragua was practicable.

Mr. BURR. It is; I say so now. It is practicable.

Senator MORGAN. Very good.

Mr. BURR. It is feasible.

Senator MORGAN. That is all I wanted to have said.

Senator DRYDEN. Professor, if the sea-level scheme of canal of which you speak should in the future be enlarged, would one result of that enlargement be to take out and to reduce the sharp angles of the canal, so as to make it safer for the vessels going through and reduce the time of passage?

Mr. BURR. The curvature could be eased, but the extremely easy curvature of the present plan is such that there is no danger in passing those curves.

Senator DRYDEN. Then you do not agree with Chief Engineer Stevens that on that plan it would be dangerous to the big vessels going through there?

Mr. BURR. I do not, Senator.

Senator DRYDEN. Perhaps you have covered that ground.

Senator MORGAN. He has been over all of that yesterday.

Senator DRYDEN. I do not wish to ask you about it again, then.

Mr. BURR. I will be very glad to reiterate it, Senator.

Senator DRYDEN. No; I will read it, Professor, in your testimony.

Mr. BURR. The curvature is so gentle, so easy, in the recommended sea-level plan that the experience on the Suez Canal—and we must, I think, come back to that on all these disputed points where we can—shows that there is no difficulty whatever in the rates of speed which we are now considering in passing ships around those curves; and you can pass an 800-foot ship—in fact, you can pass a 1,000-foot ship—through the sea-level prism as recommended with perfect safety. It would be at a lower speed, of course, than a smaller ship.

No; I disagree absolutely with the chief engineer's expression; and I will go even further than that and state that I do not know where he can find any evidence in the practical operation of marine canals which will substantiate his views to the slightest degree.

Senator KITTREDGE. Mr. Burr, while you are on this subject, can you give us the aggregate curvature of the Suez Canal?

Mr. BURR. That was asked for yesterday, and I had forgotten that it is given in detail, but not summed up, here; but I can give you that in just a moment.

Senator KITTREDGE. Yes; and then compare it with the sea-level plan that the Board of Consulting Engineers propose.

Mr. BURR. It is, I think, about 467 degrees; and there is additional curvature in the lakes. In the canal proper, between the terminal harbors and exclusive of the lakes, there is a total curvature of 467 degrees.

Senator KITTREDGE. That is at Suez?

Mr. BURR. That is at Suez; and in the sea-level plan, as proposed by the majority, there is a curvature of about 597 degrees, not a great difference. The curvature of the sea-level plan compares most favorably with that in the Suez Canal.

Senator TALLAFERRO. Mr. Burr, what would be the effect on the lock canal if one or more of those locks were destroyed, blown up?

Mr. BURR. It would simply destroy the canal until they could be rebuilt.

Senator MORGAN. What would be the effect on the sea-level canal if a great ship 800 feet long were sunk in the Culebra stretch?

Mr. BURR. It would block the canal so long as it lay there. In that case it would simply be blown up and gotten out of the way within a few days, just as was done in the Suez Canal three or four months ago. You can do that anywhere in a sea-level canal, but you can not blow up a ship in a lock.

Senator MORGAN. But there is no chance to pass by it while it is lying there?

Mr. BURR. Oh, it would be but a matter of hours, perhaps, to make a passage by in many places, but it would, of course, block the canal for the time being, until either the ship was out of the way or a passage around it made. But the probability is that the same course would be pursued as was pursued in the Suez Canal three or four months ago, when a ship was blown up to get it out of the way.

Senator MORGAN. The rolling of a stone of the magnitude of, say, 20 or 30 cubic feet from these heights down there would block it until that stone was gotten out, would it not?

Mr. BURR. Oh, no.

Senator MORGAN. It would not?

Mr. BURR. In the first place it is not a uniform slope from the top of these great cuts down to the canal. The sides would be finished in benches about 30 feet high and 12 or 13 feet wide on top, or from 12 to 15 feet wide on top. Those would catch any stone that started from any bench. It would simply fall on the terrace immediately below it and remain there. Then there is a berm 50 feet wide on either side of the canal prism at the bottom of the cut, so that it is practically impossible for any incident of that sort to occur.

Senator MORGAN. That berm and those benches would not stop an avalanche of this creeping clay that you speak of, would they?

Mr. BURR. No; if there were any; but there will not be any when the canal is done. That observation applies to either type of canal.

Senator MORGAN. Why?

Mr. BURR. Because that clay is of limited volume, and all that adjacent to the canal will be removed.

Senator MORGAN. Have you taken that into account in your estimates?

Mr. BURR. That is taken into account in both estimates.

Senator MORGAN. The removing of the slipping clay that may come down into the canal?

Mr. BURR. Yes; so that the possibility of that incident is absolutely removed.

Senator TALIAFERRO. You said that the destruction of one or more of those locks would destroy the canal.

Mr. BURR. I mean it would put it out of commission. It would make it impossible to pass traffic. Of course if this accident, which you speak of, destroyed one lock only, completely or not completely, but seriously shattered it, it would let the water out of that level, out of the summit level—in fact, while there would be—

Senator TALIAFERRO. Would the lower locks control the water if the upper lock, for instance, was destroyed?

Mr. BURR. They might; but see what would happen, Senator. Suppose the upper lock—that is, the lock at the extremity of the summit level—should be destroyed. Suppose a ship should run through the gates, and by some fortunate incident save itself from destruction, but knock the gates out. That would immediately draw off the water from the upper level. The gates below that would not have any effect upon the matter, because the water would pour into each lock below and over the tops of the gates or side walls in the shape of a cascade or a cataract.

Senator KITTREDGE. And reduce the summit level of the water?

Mr. BURR. It would drain the summit level.

Senator KITTREDGE. To what extent?

Mr. BURR. It would drain it—that is, down to the level of the bottom of the lock.

The CHAIRMAN. What would be the result if an accident of that kind should happen to the lock in the sea-level canal?

Mr. BURR. If that sort of an accident happened to one of the locks in the sea-level canal it would simply permit the water from the sea to go into the canal at extreme high tide or the water to flow out of the canal in extreme low tide, until the obstacles in the locks had been taken away.

The CHAIRMAN. That would stop all traffic upon the canal, would it not, for the time being?

Mr. BURR. For the time being, until the obstacles were taken away.

The CHAIRMAN. The same as it would in the other canal?

Mr. BURR. Yes. But pardon me, Senator, that would be a comparatively small affair, because it would affect the details only of one lock, which could be comparatively quickly put in order.

Senator MORGAN. Can you state under the control of what government the protection of the Suez Canal is at the present time?

Mr. BURR. It is under the care of the English Government; but it is a neutralized waterway.

Senator MORGAN. I understand that it was neutralized through it, but I am talking about the care of the canal—the protection of it.

Mr. BURR. It is under the English Government. The English Government owns the majority of the shares, you know.

Senator MORGAN. No; it does not.

Mr. BURR. Pardon me; that is correct; it is not a majority, but a controlling interest.

Senator MORGAN. Oh, yes; it controls it.

Mr. BURR. It owns a sufficient number to control. It is not the majority; you are right.

Senator MORGAN. Well, if the English Government owned one share, that would be a majority. [Laughter.]

Mr. BURR. It would—a working majority, anyhow.

Senator MORGAN. The English Government is there, then, to maintain the protection of that canal against all invasions or troubles of every kind. It has that business thoroughly in hand?

Mr. BURR. Yes; it is practically an English Government work.

Senator MORGAN. Very good; so that there is no interruption from any neighboring government that is possible as to the control that the English Government shall exercise?

Mr. BURR. None.

Senator MORGAN. Now, when we get in full control of the Zone here, with the canal constructed through it, we shall be surrounded by neighbors on both sides who are not people of the United States, and the property will belong to the United States?

Mr. BURR. Yes.

Senator MORGAN. Have you ever considered, or has any of these commissions that have been projecting the canal at Panama on either plan considered, what security would be requisite to maintain and protect that canal against attack from other governments or attack from mobs or attack from individuals, or, I will say, for instance, from an attack by a single citizen of Colombia? I would not undertake to make any inferences at all about the virtuous citizens of Panama in that connection, but I will take a citizen of Colombia. Is it not necessary, in your opinion, when the canal is completed, that the Government of the United States should be able to protect it against every possible invasion, as fully and completely as the British Government protects the Suez Canal at the present time?

Mr. BURR. Unquestionably.

Senator MORGAN. Very good. That is all I want to know.

Senator KITTREDGE. How would it be, Mr. Burr, in the event of locks?

Mr. BURR. It would be a very easy matter for a vicious enemy, or even one man, to disable one lock or two locks, twin locks, with a small amount of high explosive; and if two or three should unite to do such work, they could do a great deal of damage in a very few minutes. In fact, they could put the lock canal out of commission.

Senator KITTREDGE. In commenting upon that question Mr. Stevens, in his examination, said that the obstruction possible under the conditions that you mention would be just as easy of accomplishment in the Culebra cut by dynamiting the walls of the cut, or substantially that. Have you any comment to make upon that statement?

Mr. BURR. That is not justified by experience. You may explode a considerable amount of even high explosive on the surface of the ground—and that is what it would be—and it is true that the explosion makes a deep excavation. If that were made on the berm of the canal, for instance, unquestionably some of the material of that berm would be blown into the canal. But that would be a very small thing and might not affect navigation at all. I do not believe a mass of explosive put on the surface of the cut would have any sensible effect. It might throw some fragments over into the canal; but it

would be a very small matter, very quickly remedied, and might not have any such effect at all.

If you were to leave the Culebra cut unwatched for a week, and let a body of men go in there and make a tunnel and then take in several thousand pounds of explosive, undoubtedly you might get enough material down to partially fill the bottom of the cut; but that is an impossible procedure.

It is a matter of common experience that a very small amount of dynamite will wreck a very large amount of heavy machinery. In fact, that occurred in the city of New York only within a week, where a foundry was practically destroyed by an amount of dynamite which perhaps one man took in and set off. We all know what the effect of a torpedo was on the battle ship *Maine* in the harbor of Habana.

The placing of enormous masses of machinery and appliances and great structures like lock gates in an exposed position, where their serious damage would put the canal out of use, seems to me, and seemed to the majority, to be a most unwarranted exposure. It is true that the tidal lock in use during those stages of the tide that require it could be damaged also; but that does not destroy the canal. It does not put the canal out of commission except for the few hours that are requisite to get the debris out of its immediate position. There is no summit level to drain; there is no mass of masonry and machinery to be thrown down into another great mass of machinery and lock masonry.

Senator KITTREDGE. What is the weight of the gates?

Mr. BURR. Those gates have not been designed to the last detail, but each leaf of those gates for a lift of 30 feet will not weigh far from 450 tons, somewhere about that, and there will be some twelve or fourteen pairs of them. In other words, no ship can pass through the lock canal without requiring the movement of something like ten or twelve thousand tons of obstructions—movable obstructions, to be sure—and then moving them back again after its passage.

Senator DRYDEN. May I ask you what you mean by the "leaf" of the gate?

Mr. BURR. I mean each half of a gate. A lock is composed of two oblique parts which meet in the center.

Senator DRYDEN. Yes.

Mr. BURR. Now, each leaf is each half of the gate.

Senator DRYDEN. Yes; I understand.

Mr. BURR. So that the operation of the lock canal is one of movement of enormous masses of material which are actually obstructions. They are useful obstructions, but they are actual obstructions to the passage of traffic, and must be moved out of the way and then moved back again after the ship passes through.

Senator KITTREDGE. Last evening before adjournment (if this is a convenient point) I stated that before you closed your statement to the committee I wished information upon the question of comparative cost of maintenance and operation as well as comparative cost of construction of the two plans. I understand, of course, Mr. Burr, that that is stated in the reports of each part of the board, but I desire your comments upon the features that I have suggested.

Mr. BURR. The sea-level plan, as I have already stated in full detail, will not be in danger of being silted at any point of its length,

except possibly in the terminal approach channels, which are common to both plans. The Chagres River is so controlled, and all the streams between the two extremities are so controlled, that they can discharge no sensible amount of silt into the prism. That is a very important feature of canal maintenance. On the other hand, I showed that the Chagres and all other rivers discharge all their sediment into the lakes through which the lock-plan navigation is carried, and in such a way as inevitably to silt up the channel to a large extent; so that that feature of dredging is a very important element of maintenance in the lock plan, but it is a matter of no sensible importance in the sea-level plan.

Undoubtedly there will be some cleaning out of the channel as years pass, and there will be terminal dredging in the approach channels annually, practically continuously. But for the maintenance of the canal prism itself the amount of dredging will necessarily be very small.

Senator KITTREDGE. In which type—the sea-level plan?

Mr. BURR. In the sea-level plan.

Now, I desire to call your attention for a few minutes only to the estimate of cost of maintenance made by the minority of the Board.

Senator KITTREDGE. As to the maintenance of which type?

Mr. BURR. Both.

The cost of the maintenance of a canal is made up of a number of elements. There is this dredging of the prism wherever it is required and the cost of repairs and maintenance of masonry, machinery, and all other appurtenances and appliances which go to make up the total plant. In the sea-level plan there is the channel and the tidal lock at the Panama end, with a maximum lift of about 10½ feet only, and I have mentioned also the Gamboa dam, which is a feature of maintenance of the sea-level plan.

In the lock plan there are the four dams—one at Gatun and the three at the Pacific end—and a few other small features of similar character which amount to little. In addition to that, there is the very important item of these six great locks, with all their machinery and appliances, and the waste weir, with the controlling gates.

The only way of estimating the cost of maintenance of such works is either to deduce from past experience the per cent of first cost which represents the annual outlay in maintenance and repairs or to make an estimate of the organization of the different forces which would be required to do this work, and so arrive at the cost in that manner. Both of those procedures were considered by the first Commission, of 1899–1901, and both have been considered in the present instance. On pages 97 and 98 of the minority report are made two estimates of cost of maintenance for both plans on both these bases. On the whole, those methods of procedure are well enough for an approximate estimate of cost, but there is one item used there which is most misleading and absolutely erroneous in its results.

Senator KITTREDGE. In which—

Mr. BURR. At the top of page 97.

Senator KITTREDGE. In which estimate?

Mr. BURR. In the estimate of the cost of maintenance of the sea-level plan. I believe its application is erroneous in either case, but it is especially so for the sea-level plan. The old French Suez Canal

pany in its earlier days used seven-tenths of 1 per cent of the cost of excavation as the cost of annual maintenance of that

You will remember that that is a shallow cutting across the

There is one place where hills occur where the depth of excavation was about 90 feet, but that is a maximum. In general, it is excavation across the desert.

the winds of the desert raise the sand and blow it

of the canal; so that the volume of solid matter in the

unnel is augmented much in that way. The excavation

el canal on the Isthmus of Panama is a very deep

oughout about one-half of its length. The character

y is radically different from that on the Isthmus of Suez.

ne two conditions are about as absolutely and radically different

as any two conditions that can be imagined, and a percentage

ne cost of excavation applicable at Suez would be an utterly misleading gauge for the cost of corresponding maintenance of the Panama Canal; and yet that seven-tenths per cent is employed.

Senator KITTREDGE. Right there, if it will not interrupt you: Do I understand that that is erroneous to the extent of the amount given—a million and a half dollars?

Mr. BURR. Very nearly. There would be some small amount of excavation for maintenance in the canal prism, but it would be very small—in fact, so small that I do not know that it can be estimated.

Senator KITTREDGE. Then, as I understand you, your statement is that this item of \$1,512,000, stated in the minority report, is erroneous practically in toto?

Mr. BURR. It is erroneous. What that item should be I do not know. There should be something, two or three hundred thousand dollars or some small amount of that kind at the outside; but it is erroneous almost to its full extent. The application of the same percentage to the cost of excavation in the lock plan is more nearly correct. In fact, it may possibly be approximately correct for that plan, because all the silt from the tributary rivers is pouring into the lakes in such a way as to silt up the channels to a considerable extent; hence there will be necessarily a large annual cost for dredging. I should not suppose it would be as high as \$450,000, but it may be. At any rate, that item of \$1,512,000 in the cost of maintenance of the sea-level plan is almost entirely erroneous.

Then, again, the method used by the Isthmian Canal Commission of 1899–1901, which is shown at the top of page 98, has an erroneous application to this sea-level plan for the same reason. You will notice an item in the engineer department of \$652,932. While that would cover the item of dredging for maintenance, it would be out of all proportion as applied to the sea-level plan, for the reason that the silt is kept out of the prism of the canal. There should be a large item, or a substantial item, in that place, but what it would be it is difficult to say, except that there would be dredging at the terminal approach channels, and perhaps a little somewhere else, but one-half of that would be more than ample. Instead of \$652,000, \$300,000 would more than cover it.

With all the conditions of filling and silting which exist at the Suez Canal, and they are intense there both in the terminal approach channels and through the desert, the total amount of excavation in

the Suez Canal, averaged annually up to 1893, was only about 1,410,000 cubic yards, and it certainly would not be as much as that, or anywhere near, in this canal; but if you were to take that and apply to it the cost of 20 cents a cubic yard, which is a very full price, you would have about \$280,000 only instead of \$652,000, so that the annual cost of maintenance, instead of being \$2,360,000, as given by the minority, should be reduced by at least \$750,000, which would make that annual charge \$1,610,000.

The difference between that and the estimated cost of maintenance of \$2,400,000 required for the lock plan and estimated by the minority is practically \$800,000. That saving of \$800,000 annual expense constitutes an item of cost to be charged against the lock plan, but it has not been so charged. If we were to capitalize that at 2 per cent, which I suppose would be permissible for Government purposes, it would make an item of \$40,000,000, or if we were to capitalize it at 3 per cent it would make an item of about \$27,000,000.

The CHAIRMAN. While you are on that, Mr. Burr, the additional cost of one plan over the other, if I recollect it, is about one hundred million dollars, so there would be an expense every year of \$2,000,000 on that account to be charged against the sea-level canal?

Mr. BURR. That is true, on that basis. But the point I make here, Mr. Chairman, is that the estimated cost of the lock plan—that is what I am getting at—is not simply \$140,000,000, but is \$140,000,000 plus this capitalized amount, whatever you choose to take it—\$30,000,000, if you please, which would make \$170,000,000; and then there must be added to that the cost of the lands flooded on the Isthmus by these lakes. We shall keep in mind the figure of \$170,000,000, and now I should like to take up, for a moment, with you the subject of these submerged lands.

The minority has estimated, and correctly, that the submerged territory is about 118 square miles; but, as nearly as can be determined, about 58 square miles are owned by the United States Government; that is, are supposed to be owned by the United States Government.

Senator TALIAFERRO. You are referring now to the lock plan?

Mr. BURR. Yes, sir; I am now referring to the lock plan, and I am getting at the total cost, which should be charged to the lock plan. I am endeavoring to get at what is a reasonable estimate of the value of the lands submerged by these terminal lakes, chiefly by Gatun Lake. The total area is 118 square miles, and of that it is supposed that the United States Government owns 58 square miles. That 58 square miles is treated by the minority as if it had no value.

Those who take a first view of that territory would probably say that that estimate was not far wrong; but it is the best land in the whole Republic of Panama, outside of the city properties of Panama and Colon, because it is served by the railroad. There is much valuable land, although at first sight it does not appear to be so. There are banana plantations, there are villages upon it, and it is productive of agricultural and other values of large amounts. But that is all treated as of zero value. Of the remaining 52 square miles, 32 square miles, or 20,480 acres, is under private ownership, and 28 square miles, or 17,920 acres, belongs to the Republic of Panama or to private owners outside of the Zone.

Senator MORGAN. By private ownership, do you mean ownership under lease or under fee-simple title?

Mr. BURR. Under title; supposed to be.

Reading from the minority report: "An approximate estimate may, therefore, be based on the price per acre paid by the canal company for the whole area it acquired, and such an estimate would be 38,400 acres"—the sum of these two quantities not owned by the United States, "at \$7.70 per acre, making the total cost under \$300,000."

Senator TALIAFERRO. Let me inject a question there, please: How do these lands claimed there to be owned by the Government compare in quality to the lands under private ownership and the ownership of the Government of Panama?

Mr. BURR. They are largely of the best, because they are largely the land on which these villages along the railroad are located. It is the most valuable land of the whole. That is, there are some lands under private ownership in the villages, but I mean the larger portions of those villages, are located on the United States Government land. I think that that is a serious feature of the treatment of this question. There has been applied to this land its value of from twenty to twenty-five years ago, when it had practically no value. It is true enough that at that time it was not worth much; but it seems to me that we must treat this question under the light of present experience, if we are to meet it fairly.

Senator MORGAN. But the treaty is the other way?

Mr. BURR. In what way, Senator?

Senator MORGAN. That the land when condemned shall be taken at its value without reference to any improvements that have taken place since the date of that treaty.

Mr. BURR. Exactly.

Senator TALIAFERRO. I understand that Mr. Burr is now discussing the value of the land that this Government has acquired.

Mr. BURR. The treaty does state that the value of the land taken shall be that which held at the time of the making of the treaty. That is correct.

Now let us consider that for a moment and see what happens. Before the treaty was executed, in the latter days of the New Panama Canal Company, there was a dispute between the canal company and the pretended owners of some lands on the westerly side of the Rio Grande estuary, in the marsh, and on the side of the hills [indicating on map]; there was nobody living on it, and in fact it was worthy of the title which the minority very properly gives it, of worthless jungle. The matter was in court interminably, as those things usually are, or have been down there, but eventually the New Panama Canal Company was obliged to pay \$1 in silver per square meter for the amount that it took. In other words, at the rate of about \$2,000 gold per acre for worthless jungle, where no one lives, and which is not used for agricultural purposes or for anything else.

Immediately after the execution of the treaty the Commission, of which I was then a member, desired to purchase about 35 or 36 acres—I have forgotten the exact amount—on the slope of Ancon Hill, within the former city limits of the city of Panama. Obviously that made it suburban property; but a large portion of it—more than half was on a wooded slope of Ancon Hill, so steep that a goat could

scarcely climb it, and which would be of no value to anybody at any time; and yet it will surprise you, gentlemen, to hear that the owner of that land demanded \$300,000 gold for it. Of course, he did not get it. The Commission finally offered him \$55,000 gold, and he declined that. Condemnation proceedings were then begun, under the terms of the treaty, and he received between \$41,000 and \$42,000.

Senator MORGAN. Was he a citizen of Panama?

Mr. BURR. He was a citizen of Panama. That was at the rate of about \$1,200 an acre; and there are claimants of that marsh land, attaching to it a value of \$500 to \$1,000 an acre. There is a large amount of marsh land covered by Sosa Lake, and two or three claimants of that land appeared before the Commission when I was a member of it and in Panama. One of them said that he wanted this claim adjusted; that he could show that he had title to this land, although the United States had bought it with the railroad in good faith; it was a part of the railroad land. I do not think he had a shadow of justice in his claim, but still he made it, and I think he is making it still. In our discussions with him, he wanted a thousand dollars an acre. He finally said that he was willing to compromise at \$500 an acre.

Senator MORGAN. Would it not be cheap to get rid of such people at \$500 an acre?

Mr. BURR. I do not know but it would. I do not think that claim has ever been adjusted, but there are scores of such claims.

Senator ANKENY. Are you familiar with the hospital incident, where we had to buy land there to increase the hospital grounds?

Mr. BURR. Yes. I say that I am familiar with it. I am not familiar with the details, but I know the land, and have been on it, and looked over it with Governor Davis. I think the price paid there was something like \$1,200 or \$1,300 an acre. It was some such sum as that.

Senator ANKENY. Yes; it was.

Mr. BURR. As a matter of fact, gentlemen, if the United States Government should complete this lock plan it would be fortunate if it got out with the payment of an average price for all the land covered, of anywhere from \$300 to \$500 an acre, judging from actual experience which we have had there.

The CHAIRMAN. You mean, along the entire distance?

Mr. BURR. I mean the entire land covered or drowned by these two lakes. I am speaking from my personal experience with those incidents which I have mentioned.

The CHAIRMAN. Three hundred dollars an acre?

Mr. BURR. I think the United States would be lucky if it got out of it for \$300 an acre.

Senator MORGAN. Would not the Government still be fortunate if it got rid of those people at that price?

Mr. BURR. I do not know but that might be so, Senator, but I do not like to express myself quite that way.

Senator DRYDEN. What would that amount to, as an actual aggregate sum?

Mr. BURR. It would amount to a very large sum. I will tell you in a moment, including the whole 118 square miles, for the United States has value in that land just as much as any other party, and the whole must be included. At \$300 an acre the amount is \$18,656,000. So if you charge that up to the cost of the lock plan, instead of a total of 140,000,000, practically you have a total of \$188,656,000; and that is precisely what you have got to face if this plan of lock canal be constructed. It does not convey a proper or fair valuation of the cost of the work to put it at \$140,000,000. These are real items. They are all included in every such work in this country, and you can not escape them there.

Senator DRYDEN. And your figuring includes the capitalization of the excess of cost in operation?

Mr. BURR. Yes.

Senator DRYDEN. And that will amount to \$188,000,000, as you make it?

Mr. BURR. That would make about \$40,000,000, and added to the cost of land would make \$188,656,000. It is true, as the chairman has stated, that the interest on the difference in total cost should be considered also. I have not the slightest disposition to overlook that.

Senator DRYDEN. Would not that be 198,000,000? Forty million for capitalization, and—

Mr. BURR. Thirty millions I should have said, not forty.

Senator ANKENY. That is, the difference depending on whether you base the capitalization on 2 per cent or 3 per cent?

Mr. BURR. Yes; but call it thirty millions. For such purpose you may call it thirty millions.

Senator TALIAFERRO. What about the dam for the sea-level plan? Does not that submerge a large acreage of land?

Mr. BURR. It does; and that is a charge which would have to be considered, but there is this difference: The land under these two lakes [indicating on map], is along the railroad, and is the most valuable land in the Republic of Panama outside of the cities of Panama and Colon. The land submerged above Gamboa is of a different character. It is practically uninhabited. It is wild tropical forest land. It grows nothing. There are no bananas grown up there, and while there is the little village of Cruces which would have to be moved back to the hill, and a little place called Palo Grande, where one or two native shanties are found, and you may see the same thing at Pihiva. It is practically uninhabited, and put to no valuable purpose at all. It is clear out of the way of the canal line or the railroad line, and what it should be taken at I do not know, but the value is very small.

Senator TALIAFERRO. If the Government wanted it for the purposes of that dam, however, those people would want just as much for it, probably, as the owners of the other lands want for theirs?

Mr. BURR. Yes; if it is under private ownership. It is very difficult to find out. The Panama Government would probably claim a large part of it; but I think that probably \$100 an acre would be a corresponding estimate for that, and there would be about 30 square miles.

Senator TALIAFERRO. That land would drain off all those lakes, would it not, shown on that map?

Mr. BURR. Those lakes would not exist with the sea-level plan at all. They do not exist now.

Senator MORGAN. The cost value that they put upon the lands in those villages along the side of the railroad and in other places accessible to the railroad depends upon the fact that the railroad is there?

Mr. BURR. Yes.

Senator MORGAN. The best way to meet that is to change the railroad over, as we have got to do it, and let those prices drop.

Mr. BURR. And destroy the value?

Senator MORGAN. Yes.

The CHAIRMAN. It occurred to me that \$3 would be nearer the value of that land than \$300.

Mr. BURR. I do not wonder at it, sir.

The CHAIRMAN. I think if this committee would visit that country they would think that \$3 an acre would be nearer the value of the land than \$300.

Mr. BURR. That is a fact; but still, it has much more value than appears. There is a distinct value in that land. It is capable of producing a great deal. In fact that whole country, wherever it is cleared and worked, grows everything of a tropical character luxuriantly.

The CHAIRMAN. I think the only product I noticed down there was darkies. That seemed to be the main product. [Laughter.]

Mr. BURR. They are most in evidence. [Laughter.]

Senator KITTREDGE. Have you any suggestion regarding the health conditions if the lock plan is adopted and these swamps created?

Mr. BURR. I have a suggestion. It is not a practical point of so much value or so much importance as that which I have just noted, and yet it seems to me that it is a very important consideration. In fact, I think it is a very important consideration to destroy this land. I believe that the whole Canal Zone will be covered in the comparatively near future with a population much better than that which now exists, and a productive one.

Those people will learn industry, or at least those who follow them will; perhaps the adults now never will. But it seems to me a very serious matter to wipe out of existence all that valuable territory which could be made productive and contribute to the wealth of the Zone.

There is, however, one serious sanitary feature which I believe should not be overlooked, although it can not be stated in dollars and cents. The flooding of the land by those two lakes will cover up a great many mosquito-breeding marshes, as they now exist. That is true. But they will make a great many more. While this map is not absolutely accurate in all its details, the general character of this serrated margin of the lake is correct. There is much shallow water, and all around these marshes we have shallow water which will support dense aquatic vegetation.

We have observed that already in our little Rio Grande reservoir, from which the city of Panama draws its water. Aquatic vegetation grows there luxuriantly at a depth of 6 or 8 feet below the surface, at least, and that makes a margin where the malarial mosquito breeds, not by the millions, but by the millions of billions. There would

therefore be created a most favorable breeding spot of enormous area for these malaria-bearing mosquitoes.

Senator MORGAN. With no chance to screen them off? [Laughter.]

Mr. BURR. With no chance to screen them off. Obviously it is not important in such out-of-the-way places as some of the portions of this lake, but all through the main part it would be a very serious matter. As a matter of fact, malaria has been a much more serious sanitary feature of the Isthmus than yellow fever, although yellow fever has attracted all the attention. The yellow fever can be controlled. The yellow-fever-bearing mosquito is a domestic insect and breeds in clear water about houses, and they are practically exterminated.

I believe that yellow fever has ceased to be an element in the conditions of life on the Isthmus, but malaria among the natives will never be eliminated. It will be reduced to some extent, but anything which increases to an infinite extent, as the submerging of land by these lakes does, the capacity to breed those disease-carrying insects, it seems to me is a most serious feature, and it is one whose serious character will be appreciated more and more as the years go on.

Colonel Gorgas told me in conversation in response to my inquiry that such marshes where aquatic vegetation grows would be productive of just such conditions as those which I have described. In fact, one need not go to even a mosquito expert to know that, because it is a matter of common knowledge.

The United States Government has literally been spending millions of dollars to eradicate just such mosquito-breeding places as this since the Commission took possession, and it is doing it at present. It will continue to do it. These lake conditions are calculated to intensify the results which the Government has been spending millions of dollars to get rid of. It strikes me as being a very serious feature, although it can not be expressed in money value.

Senator KITTREDGE. The chairman earlier this morning, Mr. Burr, asked you at some convenient time to comment upon the testimony of Mr. Stevens. Is it convenient for you to take that up now?

Senator MORGAN. The question as propounded, it seems to me, is a little too broad—to comment upon the testimony of Mr. Stevens. It would be appropriate, I think, to ask the witness to state any facts in the testimony of Mr. Stevens that he does not think are substantially correct or properly stated.

The CHAIRMAN. That was the intention.

Senator KITTREDGE. It was not intended on my part to be in the form of a question, but simply to call the matter to the mind of the witness.

The CHAIRMAN. I think it was understood yesterday that that would be a matter to be taken up by Mr. Burr.

Senator TALIAFERRO. Is there any point in Mr. Stevens's testimony that you wish to comment on?

Mr. BURR. There are some points, and it will take but a few minutes to do it. But I should like to mention one or two matters which have occurred to me which I have not mentioned before, and which I think have a real and material bearing upon this matter.

The CHAIRMAN. Just proceed with your statement, then.

Mr. BURR. It will take but a very few minutes to do it.

Much has been said in connection with the lock plan about the ease with which the prism or the dimensions of the canal may be increased throughout its length. Now, that is true, but the point which is missed entirely in that statement is this: That while it is easy and economical to increase the dimensions of the canal prism between Gatun and Pedro Miguel, that will not increase by one ton the traffic capacity of the canal. That is the point that I want to bring out. This ease of enlargement has been mentioned and emphasized as if it were going to give increased capacity to the canal. That is not the case.

The capacity of the canal is determined by the capacity of the locks; so that you may increase the dimensions of the prism to any extent between Gatun and Pedro Miguel, but the capacity of the canal will not be increased an atom until you give additional capacity to the locks, and that means their reconstruction. It is planned to get 5 feet greater depth in the locks, 40 feet now being allowed for. But increasing the depth of water in the locks will not increase the capacity of the canal to any sensible extent, because it leaves the usable length and the usable width unchanged.

The next point relates to the transformability of this plan. When the President gave his instructions to the Board he emphasized that feature very much, and there have been expressions in the public press which are based upon the supposition that this particular plan of lock canal lends itself admirably to transformability. As a matter of fact, it is that plan of all other lock plans which both the majority and the minority agreed was so little adapted to transformability that it was believed in the Board unanimously that if this lock plan were once constructed, there never would be a sea-level canal across the Isthmus—that is, within any reasonable period in the future. In other words, that if this plan were adopted that settled the matter of transformability, and that a sea-level canal never would be attained.

Senator KITTREDGE. You now speak of the lock canal?

Mr. BURR. This lock plan; yes. In other words, it was not considered feasible or practicable within the reasonable meaning of those terms to transform this plan to a sea-level canal. That is a matter which I want to emphasize with great earnestness, because there have been some very erroneous impressions abroad in regard to it. Neither the majority nor the minority considered it adapted to transformability, and both portions of the Board assumed practically that if this plan were adopted the sea-level plan would not be attained.

Senator DRYDEN. If the lock type of canal were adopted, and it should be found that the traffic required an enlargement of the canal, could not the locks also be enlarged to accommodate the increased traffic?

Mr. BURR. They could be. It would be a very costly and inconvenient work to accomplish, but it can be done, and it undoubtedly would be done.

Senator DRYDEN. Then that would provide facilities for the increased traffic, if the locks were enlarged?

Mr. BURR. Yes. It is possible to transform any lock plan to a sea-level canal if you take the time and the money; but the real practicality of such a change, of course, is a different question.

Senator TALIAFERRO. If this lock plan is adopted, and the lock canal is built, could it, in your judgment, be transformed into a sea-level

canal at anything like the total present estimated cost for the sea-level canal?

Mr. BURR. Nothing like it. I am very glad that you have asked me that question. I can very quickly put that in dollars and cents. The Board—and when I say the Board I mean the concurrent action of the majority and minority in this case—estimated the cost of transformation of a lock plan practically identical with this to a sea-level canal, and that cost, at the unit prices adopted by the Board, is \$208,985,000, as found on page 39 of the report. Now, add to that even the minority's estimate, its own cost, without adding the forty-eight millions of dollars, which ought to be added for the items that I have just stated, taking \$140,000,000 only as the partial cost, and we shall have the cost of transformed canal on that basis as \$348,985,000, and that is only a partial cost, because the expense which has been incurred between the application of the lock plan and its transformation, the additional cost which would be paid in maintenance, lands and other damages, are all omitted. But take it even on that basis, in round numbers, and it makes the attainment of a sea-level canal cost \$350,000,000.

Senator KITTREDGE. What about the interruption of traffic?

Senator MORGAN. It would cost \$350,000,000 to transform it from a lock canal to a sea-level canal?

Mr. BURR. It would cost much over \$350,000,000 for a sea-level canal by first constructing this lock plan and then transforming it.

Senator MORGAN. That is what I meant.

Mr. BURR. That is right.

Senator DRYDEN. Would it, or not, be true that if a lock canal was transformed into a sea-level canal a very large expenditure of money for the purchase of lands and for other purposes would then have proved a wastage, and would be thrown away?

Mr. BURR. It would; in fact the cost of these great dams and locks would all be wasted.

Senator DRYDEN. Running into many millions of dollars, according to your statement, I assume?

Mr. BURR. Yes, sir.

Senator MORGAN. Then the project of transformation, if I understand it, was rejected by the entire board?

Mr. BURR. The project of the transformation of this plan was rejected by the entire board, but not the project of transformation by some other plan.

Senator MORGAN. What other plan?

Mr. BURR. It was regarded as perfectly feasible, and not incurring great difficulties, to build a lock canal by bringing the sea-level section up to perhaps Obispo, constructing the Gamboa dam as in the sea-level plan, making the locks at Obispo to raise the level up to 60 or 85 feet, or whatever might be settled upon, and then building other locks at Pedro Miguel, and either at Miraflores or at Sosa Hill. In that case, if such a lock canal were reduced to a sea-level canal, the wastage or superfluous works would be a minimum; that is, would be simply the locks at Obispo, at Pedro Miguel, and at either Miraflores or at Sosa Hill.

Senator TALIAFERRO. And the cut through Culebra?

Mr. BURR. There would be no wastage on that. That would be simply enlarged. The only wastage would be what I have stated.

That is the lock plan which is best adapted to transformation, ultimately, to a sea-level canal.

Senator MORGAN. That means a lock plan extending from Gamboa across to Miraflores?

Mr. BURR. Yes, sir.

Senator MORGAN. And the balance of it sea level?

Mr. BURR. Yes, sir; the balance of it sea level.

Senator KITTREDGE. Did you estimate the cost of transformation of that sort of a lock canal?

Mr. BURR. That was not estimated. It could be estimated on the same unit prices, but it was not. It would be far less than this.

Senator MORGAN. If you had a sea-level canal from Gamboa to the Bay of Limon and a sea-level canal from Miraflores to the Bay of Panama, by what means would you lift the vessels from that sea-level canal up to the lock canal that would span the distance between Gamboa and Miraflores?

Mr. BURR. Why, lift them in locks in the usual way.

Senator MORGAN. Is that practicable?

Mr. BURR. It is simply using the lock feature of a lock plan. That is all.

Senator MORGAN. And using it at Gamboa?

Mr. BURR. No; not at Gamboa, but at Obispo, or some point near Obispo.

Senator MORGAN. I meant in that vicinity?

Mr. BURR. Yes, sir.

Senator MORGAN. Using it there where the rising ground commences?

Mr. BURR. Yes, sir.

Senator MORGAN. And locking down where the rising ground falls off into a level?

Mr. BURR. Yes, sir.

Senator MORGAN. So that in that instance you would have a lock canal between those points that you speak of as high ground and a sea-level canal from those points, say Miraflores and Gamboa, out to the sea on either side?

Mr. BURR. Yes, sir.

Senator MORGAN. Would the control of the Chagres River be as convenient and certain and definite and satisfactory with locks located at Gamboa or in that vicinity as it would be with locks located anywhere else?

Mr. BURR. It would be more so, Senator, because a dam at Gamboa would keep any silt from the upper Chagres from entering the canal. In my judgment, that is the best plan of lock canal which has yet been suggested.

Senator MORGAN. To confine the lock system to the high ground, commencing, say, at Gamboa and ending at Miraflores?

Mr. BURR. Yes, sir.

Senator MORGAN. The balance of it to be sea level?

Mr. BURR. Yes, sir.

Senator MORGAN. In that case the transformation would take place without wastage, if I understand you?

Mr. BURR. With the minimum amount of wastage.

Senator MORGAN. That is what I meant.

Mr. BURR. Yes, sir. There would be the wastage only of the locks; that is all.

Senator MORGAN. In that case you would still retain the dam and whatever was necessary probably besides the locks at Gamboa, for instance?

Mr. BURR. You would.

Senator MORGAN. For the purpose of controlling the Chagres floods?

Mr. BURR. Yes, sir. Then, you see, when the canal was reduced to a sea-level canal, the Gamboa Dam and all its controlling works would be available for the sea level.

Senator MORGAN. For the control of the Chagres?

Mr. BURR. Yes, sir.

Senator MORGAN. As to the sea-level canal?

Mr. BURR. After the sea-level canal is reached.

Senator MORGAN. That would not be wasted?

Mr. BURR. No, sir; that would all be used.

Senator MORGAN. But the locks from Miraflores to Gamboa would be wasted?

Mr. BURR. They would be wasted. The locks would all be wasted.

Senator MORGAN. That is the sum of the situation?

Mr. BURR. Yes, sir.

Senator TALIAFERRO. That would get away from the mosquito theory, too?

Mr. BURR. Oh, yes; it would obviate that.

Senator MORGAN. I have been trying to think out that plan in my own little way, but it got too big for me when I got to Gamboa. I could not handle it.

Mr. BURR. In commenting on the facts stated in the evidence of Mr. Stevens I shall of course not duplicate or repeat what I have already said on the same points. This matter of the land valuation which I have recently spoken of is touched upon by him on page 897. He states:

"I figured that putting the value of the land as high as I possibly could, stretching my conscience to that extent—mind you, if I were buying there I would not pay any such prices—it would be necessary to acquire not to exceed \$300,000 worth of privately owned tracts."

I differ radically from that. It would be many millions, for the reasons that I have just given.

Senator DRYDEN. There is a difference of over \$18,000,000 between you on that proposition, as I understand it?

Mr. BURR. There is some discrepancy, Senator.

Senator MORGAN. In the case of a lock canal between Gamboa and Miraflores, which would pass through the Culebra cut, how could the transformation be made, say in the greater depths of the cut there, while the canal was in operation, without widening that cut to perhaps double the width?

Mr. BURR. Either in transforming a lock canal to a sea-level canal, or widening a sea-level canal, it would only be necessary to take off a uniformly thick layer of material.

Senator MORGAN. On one side?

Mr. BURR. On one side or divided between the two.

Senator MORGAN. Up to the top?

Mr. BURR. Up to the top.

Senator MORGAN. Very good.

Mr. BURR. From the top down to the bottom of the canal.

Senator MORGAN. But in transforming a lock canal into a sea-level canal on the plan proposed it would be necessary to take off this space. Now, could that be done with the canal still in use?

Mr. BURR. Oh yes, sir; there might be a little inconvenience to some ships at times, but it would not be serious.

Senator MORGAN. You could maintain the lock system through that whole affair until, by sections, you could replace it with a sea-level canal?

Mr. BURR. Yes, sir; provided the locks are designed for that purpose when first built.

Senator MORGAN. Well, of course.

Mr. BURR. Yes. That is entirely feasible.

Senator MORGAN. It is entirely feasible?

Mr. BURR. Entirely so.

Senator KITTREDGE. What would be the increased cost, if any?

Mr. BURR. I have not the estimate made for that particular transformation, but the estimated cost of transformation of the actual plan would be as I have given it. What it would be from the lock plan which I have suggested to a sea-level plan I can not state. To make a rough guess, it would be less than half that of the other plan.

Senator KITTREDGE. How much more would it cost to construct a canal with locks such as you have just now suggested and then transform it to a sea-level canal than it would to construct a sea-level canal in accordance with your proposition?

Mr. BURR. Well, the principal item of waste would be the six locks. I suppose that that item would be represented by about thirty-five to forty millions of dollars. Then, the added cost of excavation to be made under those circumstances is something that would have to be determined by very careful consideration of all the circumstances; but I feel confident that my guess of less than half of the cost of transformation by this process would be true.

Senator MORGAN. That is chiefly on account of the facility of carrying off the spoil.

Mr. BURR. Yes; and then the waste of these great dams and locks in the present lock plan.

Senator MORGAN. If you had a canal through what we call the Culebra heights in operation, and you wished to widen or transform that canal by cutting down the bank on either side, or on both sides, it seems to me that there must be a very important advantage in having water transportation for the spoil out to sea on the canal?

Mr. BURR. There is. There is no question about that. And it is quite possible, too, that our means for excavating rock under water will be so improved as to reduce the cost of that part of the process of transformation. We can not say how much, but that is a reasonable expectation.

My attention is first attracted to a statement by Mr. Stevens on page 918. On that page I observe that Mr. Stevens states that "a very large ship could never be assured of getting through a sea-level canal of the dimensions reported without grounding, unless she ran at such speeds as would practically destroy the usefulness of the canal, for this reason, that out of the 49 miles there is over 29 miles that is

only 200 feet wide, and you can see from the map that it is more or less tortuous in direction."

I can only say that the experience in ship canals all over the world flatly controverts that statement; that is, it is contrary to experience in such ship canals as the Suez, Manchester, Kiel, and other ship canals of Europe, all of which have materially less prism dimensions than the sea-level plan proposed.

Senator DRYDEN. Is the curvature in these canals as sharp as in the proposed sea-level canal?

Mr. BURR. In some of them it is sharper, Senator.

Mr. Stevens further says that "this situation would be accentuated by the immense number of small streams carrying flood water directly into the canal at the depths that they would, from 30 to 150 or 160 feet. They are constantly carrying in detritus that would make shallow bars that would very soon render the navigation of such a canal impracticable for large ships, and sooner or later for all ships, unless there were a fleet of dredges kept constantly working from one end to the other to keep it open."

I think that probably Mr. Stevens had not at that time an opportunity to examine the sea-level plan, because it is one of the marked features of that plan, as I have emphasized over and over again, that no detritus from any stream is carried into the canal—absolutely none.

Senator DRYDEN. I would like to ask one more question on this point of curvature before we leave this finally. Are the vessels which pass through these other canals—the European canals and others which you have referred to—as long and as large as the vessels that will be likely to pass through this canal in the Isthmus of Panama?

Mr. BURR. The largest vessels that I know of that are passed through those canals are a little less than 600 feet, as I stated earlier in the session to-day. They have repeatedly passed through the Suez Canal, which has a much smaller prism than the recommended sea-level prism in this plan.

Senator TALIAFERRO. And practically as much curvature?

Mr. BURR. Practically as much curvature.

I have noticed on page 925 and at some other points Mr. Stevens's statement to this effect: "The consulting board, I understand, was created to furnish information to the Commission and to Congress. I have, however, checked independently of the board and independently of anyone an exactly similar proposition"—that is, as to the cost of the lock plan. And at some other points which I can not readily find, although it is not important, the same statement is made that the matter of determining the plan for this canal was taken out of his hands and put into the hands of the consulting board. That specific statement is made, although I can not turn to it just at this moment.

The CHAIRMAN. That is what the Consulting Board was for, was it not, Mr. Burr?

Mr. BURR. I should like to say a word or two, and that is all, in behalf of the Board on that point. In the Executive order of the President, dated June 24, 1905, this language is used: "It is hereby ordered that a Board of Consulting Engineers, consisting of"—giving a list of the names of the members—"shall convene in the city of Washington, at the rooms of the Isthmian Canal Commission, on the 1st day of September, 1905, for the purpose of considering the vari-

ous plans proposed to and by the Isthmian Canal Commission for the construction of a canal across the Isthmus of Panama between Cristobal and La Boca."

I wish to call the attention of the committee to the fact that the functions of this Board were consultative and not of a creative character. It was instructed by the President "to consider the various plans proposed to and by the Isthmian Canal Commission," and for no other purpose.

There were transmitted to the Board the plans of the Comité Technique, the plan of the former Isthmian Canal Commission, plans by Mr. Bunau-Varilla, Mr. Bates, and suggestions by one or two others, but no plan whatever by the Isthmian Canal Commission itself, although it was stated by the President that such plans would be submitted.

I believe that I am not violating the confidences or the privacy of the Board when I say that it was a matter of some embarrassment to many members of the Board to find itself in such a position that it was obliged to act in a creative capacity by the failure of the Commission to submit the plans which the Executive order said would be submitted, and that was the reason why we were obliged to create plans as well as consider some plans that were put before us. That is a chapter in the history of the Board's work which ought to be appreciated.

So that I must disagree with Mr. Stevens when he says that the function of creating plans was taken from his hands and put into the hands of the Board. I have nothing to say, of course, about his own functions. I merely mean to say that the Consulting Board was not intentionally usurping his functions.

Senator TALIAFERRO. Suppose the Canal Commission had submitted a plan, practically the plan adopted, for example, by the minority of your Board, would it have affected your Board in its conclusions in any way?

Mr. BURR. I do not think it would have affected the conclusions as to the type of canal. I think they would have remained unchanged. But it would have affected very materially much of our duties, and would have enabled the Consulting Board to have closed its work much sooner.

On page 930 Mr. Stevens questions the accuracy or the reliability of the Board's estimate of cost of certain diversion channels, including the partially constructed Gatun diversion, running from Gatun over into the Bay of Manzanillo, behind Colon, and certain dams across the Gigante and the Gigantito, and one or two other streams on the westerly side of the canal, for the purpose of backing them up and causing them to flow over the divide away from the canal into other streams which lead to the ocean, an item amounting to three and a half millions of dollars; and that has also been questioned by the Commission.

I simply wish to say that those watersheds were all accurately surveyed by either the old French company or the new French company, and their contour maps are strictly accurate for the purposes of such subsidiary works as these involved. That estimate of the majority was questioned by the minority in the Board's session, and in consequence of that a reexamination of all those estimates was carefully made, and it was found that the allowance, \$3,500,000, to which the usual 20 per cent would be added, making \$4,200,000, was ample to cover all those items.

Senator KITTREDGE. Did the minority agree to that proposition?

Mr. BURR. It was a matter which did not come up for action in the Board, so that there was no opportunity for formal agreement, but I suppose that they were satisfied at the time. I can not state whether they were or not. Although it is a small item, it was most carefully reexamined and checked, and I am confident that it is ample to cover those items.

On page 931 Mr. Stevens questions—I will not say questions, but expresses a little doubt as to the stability of the Gamboa Dam across the Chagres. I can only say that the undoubted and indefinite stability of that dam is founded upon precisely the same elements as the stability of any similar engineering work.

If it is designed either as a masonry dam on bed rock, or if it is a great earth dam with the masonry core carried down to bed rock, all as recommended by the majority of the Board, it will be as firm and stable as one of the mountains adjoining it, and an earthquake would not affect it. It will be, when completed, with the earth fill on either side—and that really should be used whichever type is adopted—practically a mountain across the valley. There are much higher masonry dams, one recently completed across the Croton River near New York for the water supply of that city. There is not the slightest question of its stability, if it is properly designed and constructed, which, of course, would be a matter in the hands of the constructing engineer.

On pages 935, 936, and 937, Mr. Stevens again enlarges upon the difficulties of getting large ships through the sea-level canal. I can only state what I stated before, that the world experience with ship canals is directly at variance with his suggested difficulties, even where those canals have a less prism or less dimensions than that of the proposed sea-level canal. There would be no difficulty whatever in getting a thousand-foot ship through the sea-level canal.

Senator ANKENY. No difficulties of whatever kind due to curvature, depth of water, or anything?

Mr. BURR. There would be no difficulty whatever.

Senator ANKENY. Of any kind?

Mr. BURR. Of any kind.

Senator ANKENY. I thought you were confining yourself to the question of curvature, or depth, or something of that kind.

Mr. BURR. I mean with the recommended plan of the sea-level canal, with the curvatures and depths and dimensions there adopted.

Senator ANKENY. There would be no difficulty with the greatest ships afloat?

Mr. BURR. With the greatest ships afloat. Of course, the largest ships afloat would go through with less speed than the smaller ones.

Senator ANKENY. I understand; but there would be no physical difficulty whatever?

Mr. BURR. No physical difficulty whatever. That objection is very much like one which was made some time before the New York subway was opened, when it was stated that the curves were so sharp that it would be impossible to get a train around them. A good many trains have since passed without the slightest trouble. It will be the same way with this canal.

On page 940 Mr. Stevens mentions the fact of doing damage with high explosives on the banks of the canal; but as I have already touched upon that, I will not repeat what I have said.

On page 942 Mr. Stevens says in one place: "There are one or two discrepancies, however, in the majority report which I can not quite reconcile which must be taken into consideration." And then a little further on:

"Now, frankly, I do not believe that the sea-level estimate is correct, for several reasons. In the first place, while I am chief engineer of the Commission, I never yet have satisfied my own mind or become satisfied as to what it is going to cost, even approximately, to take out the lower 40 feet of that canal through Culebra Cut."

Then, still further on:

"The Board reported that the cost of taking out the material from plus 10, which is 10 feet above the sea level, down to minus 40, which is 50 feet (40 feet of which, as this profile shows and as we all know, is rock), \$1.25 a yard. Well, I do not know anywhere in the world where rock has been ever taken out under just those conditions—in other words, under as hard conditions as these would be. I have not studied up any plan yet whereby, either as engineer or contractor, I would start to take it out. Of course it is possible that that estimate may be correct."

I think that the chief engineer scarcely gave that matter sufficient consideration. Of course if he says deliberately that he is unable to determine any manner of taking that rock out, I should have to accept his statement; but I believe that he is too good an engineer really to mean that. Rock has been taken out in this country and in other countries the world over for, I was going to say, centuries; perhaps that is a little extreme, but in all the past history of modern engineering works, in precisely those conditions.

There is at the present time in progress a contract which I have already mentioned in St. Marys River which was let in 1904, I think, to MacArthur Brothers, of Chicago, for taking out about 2,000,000 cubic yards of rock under water in the bottom of that part of the St. Marys River channel which is called the Upper and Middle Neebish. The water of the river was flowing over it, and yet they agreed to take that out for \$1.36 a yard and are having a very profitable contract.

They did that, however, by putting a dam across the river at either end of the stretch which was to be excavated and then unwatering and excavating it in the dry.

I was engaged myself, commencing three or four years ago, in connection with a contractor in New York, acting as his engineer, in taking out a large amount of rock, mud and sand under water, on a line of the subway where it crosses under the Harlem River at a depth of 55 feet below the surface. That space was also unwatered, and the rock was taken out without the slightest difficulty.

In regard to the Culebra Cut, as I have said before—and will say it again with all earnestness—if one can clear the lions out of the way, which exist in the imagination of so many people, that work has no more real difficulties than work that is being constantly done on a large scale by contractors in this country every year. The Culebra Cut is a cut through a great hill. It has hard rock at the bottom in large quantities—perhaps all hard rock. It has softer rock above, and clay on top. It is simply a matter of undertaking that large piece of work intelligently and carrying it through.

The excavation above plus ten was put at 80 cents a cubic yard by the Board. I believe that price is too high, for the reasons I have already stated, but I concur in it and accept it. We all accepted it, because we believed it was better to overestimate the cost of this work than to underestimate it.

The rock below water, to be taken out under water, was put at \$2.50 per cubic yard, which is far more than required anywhere on the Isthmus or here. It is being taken out in Europe by Mr. Hunter, who was a member of this Board, at about 70 cents per cubic yard in his work, and it can be taken out on the Isthmus of Panama for probably one dollar to one dollar and a half a cubic yard—actual cost, I mean.

The Board named \$1.25 per cubic yard for the excavation of the rock between plus ten and the bottom of the canal for the reasons which I stated yesterday. The rock is harder at that depth, the space is more cramped and limited for the use of tools and appliances, and it has to be lifted somewhat higher, but it is a perfectly plain, straight piece of excavation of rock in the dry. There will not be a yard of that rock taken out under water. In fact the sea water can not get into the bottom of that Culebra Cut until it is permitted to come in. The bulkhead or dam at each end will keep all water out—sea water or any surface water. What little water comes in from springs or which flows down from the rainfall into the pit will be pumped out just as it would be pumped out here.

There is not a single process of that operation from beginning to end which is not in standard and daily execution by contractors and engineers in this country—I was going to say every day in the year, and I believe that that is not very far out, excepting Sundays, and sometimes not excepting Sundays even. But there seems to have been in some way or other in the minds of so many people an awe-inspiring apprehension that somehow or in some way, or from some source, that work is surrounded with difficulties indescribably and obscurely dreadful, and Mr. Stevens seems to be affected a little that way. As a matter of fact, that price of \$1.25 a yard was agreed to by the entire Board.

I have forgotten whether the vote was unanimous or not, but it was a board price, and not a majority price or a minority price. It is ample to cover all that work. Furthermore, there is not an item of estimated cost of excavation or masonry either in the majority report or the minority report which was not gone over with the most scrupulous care; and I can only account for Mr. Stevens's statements in regard to it as being made hurriedly, without the time to examine the data carefully. I believe those must have been the circumstances under which he gave his testimony. I think that if he had had the time to look over these matters carefully, he would not have made the statements which are found here.

On page 943 he mentions the matter of maintenance and operation, which I have already covered in detail, and which, therefore, I will not repeat. He, in my judgment, makes the same error that the minority commits in dealing with that feature of the question.

On page 945 he speaks of the effect on the canal if the Gamboa dam should be carried out. You might just as well spend time discussing the effect which would result if an earthquake should shake together the two sides of the Culebra cut, after the canal is completed on either

plan. The stability of a simple work of that sort is assured beyond all question at the present time.

On pages 956 and 957 Mr. Stevens makes reference to what was found in the borings shown on that blueprint plan before you, and there again I think that he would have modified his statement if he had had time to consider it. I feel sure that some of the statements made here are due to inadvertence, because they are directly at variance with what was actually found in those borings. He states at one point, for instance, that "the result showed that something like 200 feet overlying the rock—the so-called 'indurated clay'—there was a blanket of clay, with a small mixture of very fine sand, and that no permeable material—that is, material that would carry water—was found for a depth of about 200 feet."

I pointed out yesterday, and it can be seen from that blueprint plan, that from depths of 32 feet down to over 200 feet the water-bearing material, and of course permeable material, consisting of sand and gravel and sometimes a mixture of sand and clay, were found at various depths. In other words, permeable water-bearing material was practically found all the way down from about 32 feet below the sea level to nearly 250 feet. I feel confident that these statements were due to inadvertence on the part of Mr. Stevens, but still I think that I ought to call attention to them.

Mr. Stevens, on pages 959 and 960 and at some other points, speaks of the greatly increased permeability of material at the Bohio site over that at Gatun, and that there was no permeable material at Gatun. Now, that is partially in accordance with the facts—that there is more permeable material at Bohio than at Gatun; but at Gatun there is a large amount of permeable material also, as is shown by that blueprint plan which you have before you.

One point made by Mr. Stevens, on page 960, is so admirable that I do not wish to lose the opportunity of concurring with him. In answering a question as to the construction of a dam at Bohio, he says: "I should certainly want to cut off some of that flow of water that might possibly occur through the subaqueous foundation." And he mentions in other places—one or two other places—that the under-water seepage should be cut off. I think that he is absolutely right in that, and I am very glad to register my full concurrence with him; but, unfortunately, the proposed Gatun dam for the lock plan is based upon a directly opposite view of that question—that it is not necessary to cut off the underflow.

On page 961 Mr. Stevens states that the deepest boring was 204 feet; but we have already observed that it was 258 feet. I presume that that was also an inadvertence.

In the vicinity of page 964 he also speaks of the foundation of the dams at the Panama end to the canal, with reference to which I have already expressed my judgment so fully that nothing further will be said about that.

On page 977 he expresses himself in reference to the time of passage of a ship through these two types of canals. He says: "I think the passage through a lock canal will be safer." And he also states, in some place that I can not directly turn to, that it is also quicker.

In answer to a question he expressed his preference for a lock canal, even if a sea-level canal could be built at the same cost and in the same time. He said even then he would prefer a lock canal. Here it is.

He says, in answering a question: "Because I think that the passage of ships would be quicker. I think the cost of operation would be no more—if more, very little—in case of a lock canal. I think the cost of maintenance of a lock canal would be very much less. I think the passage through a lock canal will be safer. I think, in case future developments should require enlargement, the lock canal can be made of much larger capacity very much more quickly and cheaply than the sea-level canal."

In estimating the time of passage for a ship, he leaves out of account entirely, as the minority does also, the delays that would occur at the terminals in case a number of ships should be there at the same time; and he also omits consideration of all contingencies and exigencies which are likely to occur in connection with the operation of machinery and appliances to which I have already made such full reference.

How anyone can consider the passage of a ship through these locks, lifting them up to great heights and down again, as being safer than in straight sailing through a sea-level canal, is beyond my comprehension. I confess that I am not prepared to enter into any detailed argument on that question.

Senator TALIAFERRO. Would not that include the question of speed also—the time as well as the safety?

Mr. BURR. The time of passage involves the question of speed. It is true that over a short portion of the lake navigation there would be stretches where a ship could steam at a higher rate of speed than on the sea-level canal proposed. But even the minority does not advocate an increased speed of more than about 2 miles per hour, as I understand their position, and that is far more than made up by the delay at the locks. In fact, as I have already stated in the earlier part of this session, there is not any way in which a recognition of the actual circumstances of navigation of a ship canal can make the passage, month in and month out—and that is what you have to count on in the long run—by ships in a lock canal much less than double the time it would take to go through a sea-level canal, taking into account the delays from all sources and the repairs.

Senator TALIAFERRO. Taking into account the ideal conditions, is it not your judgment that a ship would go through a sea-level canal in much less time than through a lock canal with five or six locks?

Mr. BURR. I do think so; I think so without question, unqualifiedly.

Senator DRYDEN. Is it not claimed that the length to which the vessels can go unobstructedly on this lake is about 19 miles of the proposed lock canal?

Mr. BURR. I have forgotten as to that, Senator Dryden; but there is not that length of line which I believe would be considered safe enough for that kind of navigation. You were not present when I spoke of the dangers of submerged channels.

Senator DRYDEN. No.

Mr. BURR. A very long stretch of which is found in this lake; but there, in that feature, is found the restraining influence as to speed. The passage through submerged banks is one which is always involved in some risk, and sometimes very serious risk. Consequently a submerged channel must be far wider, perhaps twice as wide or more, to give the same safety to navigation as a channel between banks which are visible, and there is where much of the advantage of lake navigation will be lost.

I have but one thing more to state, and that is a very short and small one:

It has been stated, and is stated in the minority report, that the computed seepage under the Gatun dam can never exceed about 10 cubic feet per second (I think that is the value, but I shall correct it if it is not; I think that is correct, however), and it is said that that is too small a matter to be the cause of any apprehension.

I have been somewhat familiar with the computation of the flow of water through sand for filtration and similar purposes for a considerable period of years. The whole subject has been reduced to exact analysis within the past twelve or fourteen years only; and those computations are based upon the ideal conditions of regulated and rigidly determined sand in a laboratory. There is a uniform, perfectly uniform, texture of the sand, so to speak, in those small laboratory experiments, the results of which are the basis for this computation.

No such conditions exist in a great geological profile as those which are assumed in these small laboratory experiments. It is a purely theoretical computation, originally made by the late George S. Morison in connection with the Bohio dam, and the results of such purely theoretical computations upon assumed conditions radically different from those found at the actual site are not worthy of very serious consideration. They are certainly not of sufficient reliability and are not sufficiently well founded to justify the grave hazards which are involved in that kind of construction. They are applicable, and ordinarily made applicable only, to such artificial constructions as filter beds used in connection with public water supplies, where the whole plant is put in place in the most careful manner so as to secure the conditions which belong to the computations. Then the results of those computations are correct. But to apply them to a geological profile like that shown on that blueprint, with wide and violent changes of texture of material in the space of a few feet, is to use them in such a way as to vitiate the value of the results.

Gentlemen, that is all that I have to say, unless there are more questions to answer. After the most careful study of this question, and with a perfectly open mind, during the past six years, I am convinced that the sea-level canal will most fully meet the requirements of this great waterway, and that it is the only type of construction which this Government should undertake. I believe that even if a lock plan should now be adopted, and if work should be begun on it, the completion of the work would find it a sea-level canal.

The CHAIRMAN. Gentlemen, do any of you desire to ask Mr. Burr any further questions? If not, Mr. Burr, we certainly appreciate your presence here, and thank you very much for coming.

(The committee thereupon adjourned until to-morrow, Saturday, March 10, 1906, at 10.30 o'clock a. m.)

ISTHMIAN CANAL.

COMMITTEE ON INTEROCEANIC CANALS,
UNITED STATES SENATE,
Washington, D. C., Saturday, March 10, 1906.

The committee met at 10.30 o'clock a. m.

Present: Senators Millard (chairman), Kittredge, Dryden, Hopkins, Knox, Ankeny, Morgan, and Taliaferro.

STATEMENT OF LINDON W. BATES.

The CHAIRMAN. Mr. Bates, state your full name, residence, and occupation, please.

Mr. BATES. Lindon W. Bates; residence, New York; occupation, civil engineer and contractor.

The CHAIRMAN. I understand that you are ready to proceed, and I believe that you have your statement prepared, so that we will endeavor to let you go along without interruption until you have completed your statement.

Mr. BATES. I would say, Mr. Chairman and gentlemen of the committee, that I have this morning things to say to you which are quite different from anything that you have so far listened to, I believe. I want to say at the outset that I have criticised things, and not men; official acts, and not individuals.

I was born in 1858, and am 47 years old; was educated in the Central High School in Chicago and the Sheffield Scientific School at Yale. The speaker began work in 1877 with the Chicago, Burlington and Quincy, but after a few months went to the Pacific coast, where he served as engineer with the location and construction forces of the Northern Pacific, Oregon Pacific, and Oregon Railway and Navigation companies. Presently he entered business independently as a contractor, and executed constructions in Oregon, Washington, and other parts of the West. At Kansas City, in 1885, he changed the mechanism of a new dredge that had failed, and executed the reclamation of the Kaw, where the stock yards now stand.

Next, he built a larger machine, which was destined for lower California, but which was taken instead to a contract on Puget Sound. There he reclaimed the land for the Northern Pacific terminals, damming the Puyallup River there. The Puyallup dam was the first one ever made with a hydraulic dredge; the year was 1888. At Portland, Oreg., he filled from the Willamette the terminals for the three Pacific railways centering there. These included a raised dike across Guilds Lake to carry the main line of the Northern Pacific, which was the second damlike embankment to be made with a hydraulic dredge.

By this time, 1892, he believed that the best elements had been worked out, one by one, from experience and experiment, for the most successful type of dredge. He went to Chicago and contracted in 1893 on sections A and B of the drainage canal, building for use there two small hydraulic dredges on new lines.

A member of the board of consulting engineers, in recommending this type of plant, states, regarding these two pioneer machines (p. 405):

"You will note that in several instances I suggest hydraulic dredges for removing material overlying rock. This is in accordance with my experience on sections A and B of the sanitary district of Chicago, where we used two hydraulic dredges," etc.; and, again, "employed in the construction of some important dams in the western part of the United States."

It is of import that the experience here cited is that upon which some hydraulic-dredge possibilities are recorded. It considers two of the writer's pioneer machines of 1893 of 300 horsepower.

On page 69 of the minority report is given the process for constructing the huge dam of 21,000,000 cubic yards. This dam is the heart of the minority's design—one of the two central elements by which its canal must stand or fall.

The process reads (p. 69):

"The lower part of the dam up to elevation 50, or even to elevation 80, is to be made from material dredged from the canal between the Gatun locks and Limon Bay, pumped by a suction dredge into the dam," etc.

This system received from the chief engineer of the canal full indorsement. His examination before your body reads (p. 900, Senate committee's report):

"The construction that is proposed for that [dam] is not to pile that dirt in there largely from railroad trains, but to take it from the mass that is excavated here by dredges, bring it up to that point, and pump it with hydraulic pumps from the barges or drop it into a basin and pump it from there into the dam."

The speaker, since this date of 1893, has devised and constructed hydraulic excavators up to 5,000 horsepower. Yet these, his very latest machines, the most powerful dredges ever attempted in the world, could not perform the task set them here by the minority. How and why he will presently show. He reverts now to the history.

In 1894 he was invited, among several others, by the Mississippi Commission to submit designs for a dredge for the mechanical removal of the bars, which \$36,000,000 sunk in training walls, etc., had failed to remedy. The proposals were to be competitive. The machine must deliver 1,600 cubic yards per hour—three times what had ever been done before. A premium was promised of half the cost if this output could be raised 50 per cent. He built the *Beta*, which delivered over 5,000 cubic yards an hour, and was awarded the full premium of \$87,000. That output has never since been reached in America. The art has remained here stationary—exactly where it stood eleven years ago.

The *Beta's* record, 800 per cent above the nearest second, revealed to him that a new era was about to open in the science of waterway improvement. He felt that he could construct the first requisite—

the tool. He believed that Europe afforded a wider field of opportunity, and he went abroad in the summer of 1896.

BELGIUM.

In the autumn there were arranged for him joint conferences with premier and minister of public works of Belgium. There was under consideration there the largest national public work then contemplated in Europe—the Grande Coupure of the Scheldt below Antwerp. General Brialmont, Sir John Hawkshaw, Maas, Stoessel, and others had already made designs for it. The speaker stated to the minister that time and cost could both be materially reduced by new methods. He was invited to prepare and submit a plan as the city of Antwerp and the central Government had quite different views. In due course this was submitted. He then learned a fact of which he was unaware, that some time before the ministry had privately requested a design for this great work from Oberbaurath Ludwig Franzius, of Germany.

The Oberbaurath was the father of that monumental triumph in engineering—the Weser River regulation. He was conceded to be the greatest living hydraulic and harbor engineer. The Bates project was sent to him by the minister for a report. Its general points were found to be identical with the German's. But there were certain important differences in adjustments, alignments, and methods of economizing costs, which the new tool for the first time made possible. The Oberbaurath, too supremely high to fear any insecurity or competition, wrote this magnanimous summary: "I associate myself with the conclusions of Mr. Bates." Through all his European experience no friend extended a more encouraging and generous hand than this first and greatest critic.

The project was next submitted to the Belgian committee of National Ponts et Chaussées. They likewise indorsed it. But before the minister would engage his approval a commission of two engineers was appointed to proceed to America, investigate and report. The report was published in the *Annals des Travaux Publiques*, the official organ of the Government, in March, 1897. Upon delivery of its verdict the premier gave his approval. The investigation committee's report was sent for later by the Russian Government when a commission given him made knowledge of his credentials imperative there also. The Grande Coupure, owing to its financial side, was taken from the technical to the political arena. Now, however, the improvement increased to \$50,000,000 has just been voted by the Belgian Chamber of Deputies.

Subsequent to this he spent many months traveling, to inspect at first hand the European rivers and harbors and to study the engineering treatments that were in progress to secure the fullest service to navigation. He visited every port of prominence in Europe and North Africa. Later he had business reasons to visit India, Australia, the Philippines, China, and Japan. He came thus into actual personal contact with the experiments, the failures, and the successes of nearly all the world's great ports and waterways.

RUSSIA.

In the winter of 1897 Prince Hilkoff, minister of ways and communications of Russia, commissioned him to study the Volga and report upon the deepening of its bars. Later the minister extended

the commission to include the Black Sea ports. He was to design improvements, having reference not alone to their commercial, but, also, to their military service. A naval officer was detailed to accompany him and get from the departments of the various places the data required.

His report to Prince Hilkoﬀ examined and designed improvements for the Volga bars, the possible enlargement of the canal system Marie, the Volga mouths of the Caspian, and the Russian mouth of the Danube, together with the Black Sea ports of Rostoff on the Don, Taganrog, Kertch, Nicolsiev, Kherson, Odessa, and Ackerman.

Subsequent to these presentations the Russian Government ordered a fleet of dredges for use on the Volga bars. They were constructed by one of the largest works in Europe, the Societé Cockerill, of Seraing, Belgium, who are still his continental builders, according to his designs and under his personal direction.

There came to these trials a commission of three sent by the German Government, then discussing the Great Central Canal; a committee of one sent by the Suez Canal, already then being pressed by ship-owners and the English authorities for enlargement; another of one from the Manchester Canal; three engineers sent from the Oberbaurath's Weser River board, four men of English harbor boards, one committee of three from Australia, ten representatives from France and the French ambassador, two from Austria and its ambassador, one from India, one from Siam, four from Russia and its ambassador, the Turkish ambassador, one from the Danube, and hundreds from Belgium itself. So general was the interest that for some days of the last week the State railways ran excursion trains to accommodate the numbers who wished to inspect and see these tests.

There had been offered a premium of 150,000 roubles if the machines would reach a stipulated output under rigorous conditions. The trials were exacted in duplicate, one series on the Scheldt and one at St. Petersburg, but when the output on the Scheldt went 200 per cent above the requirement the full premium of 150,000 roubles was paid. A recent letter from Prince Hilkoﬀ states that these machines were giving satisfaction, and that the unit cost upon Volga bars was the lowest of any method tried. The Russians were engaged on the Volga and at Kherson, Nicolaiev, and other ports, in accordance with the recommendations, when the war broke out.

QUEENSLAND.

In 1898, before the Russian order was filled, the speaker was called to Queensland, Australia, by its government to examine the harbor and river of Brisbane. On his arrival several of the other ports up the coast sent to the home secretary a request that their ports be included. He was finally asked to examine and make projects for nine ports connected with their five rivers. He prepared designs for the Brisbane River and Harbor, for the Fitzroy River and Rockhampton Harbor, for Bundsberg, Townsville, Mackay, Cairns, and the Norman and Albert rivers of the Gulf of Carpenteria, etc.

On the Fitzroy River there is now being constructed a great system of training embankment by the same hydraulic dam building process which the minority propose to employ. The writer's dredge, *The Archer*, is pumping the material from the bottom of the river.

into dam-like embankments. He is himself in consultation, giving the directions for the construction. He knows, therefore, here from first-hand intimacies of execution, the ruling facts of which he will presently speak. He has himself tested and experienced the limitations.

SOUTH AUSTRALIA.

In 1901 a parliamentary report was made for the South Australian government. The other ports of the colony here also asked to be included, and he was finally bidden to prepare projects for six harbors, for a proposed extension of the railway system, and for a navigable access to the Murray River. There was included in the report a design for the outer harbor of Port Adelaide. This had been a technical and political controversy which had gone on for more than a generation. He designed improvements also for Largs Bay, Port Victor, the Murray mouth, and Kingston Harbor.

The construction of the outer harbor of Adelaide has been now three years under way, and at Brisbane, Rockhampton, Largs Bay, and numbers of smaller places works are being continuously prosecuted and executed.

INDIA.

Upon the invitation of the chairman of the Calcutta port board, the speaker made an exhaustive examination of the bars of the Hoogly. He designed a method of treatment and improvements for the river and certain works for the harbor.

The harbor board at Bombay, about a month ago, sent him a request to make up for them a project involving 25,000,000 cubic yards of combined reclamation and harbor improvement.

In Queensland, in South Australia, in Calcutta—indeed, in almost all these countries—the Government forces of engineers, draftsmen, etc., were put at his disposal to collect data and to do the details of the work.

EGYPT.

He had been for some time in correspondence with the authorities of the Suez Canal, whose meager dimensions had long been a source of discontent to English merchants. Sir John Stokes, an English member of the board, recognizing that the passing of the *Hercules* to Australia would give a very favorable opportunity for settling the much-discussed question of cost and facility of canal enlargement, enlisted the interest of Mr. Joseph Chamberlain, then colonial secretary. At Mr. Chamberlain's request the Queensland government granted permission for the dredge *Hercules* to halt on her way out and make in the Suez Canal a demonstration of what the new order might or might not accomplish. These Queensland dredges had been built by the Sir William Armstrong Whitworth Company (Limited), of New Castle-on-Tyne, who are still his English builders. The Suez has many varieties of material, among them a very dense and tenacious mixture of clay and gypsum. Since the Australian machines were built to handle sand alone, costs could not be expected to reach their minimum or capacity to reach its maximum, but certain safe approximations could be reached. Here was a chance to study one great sea-level-and-lake canal over water and under water.

In Egypt, at the invitation of the English minister of public works, Sir William Garsten, he went up the Nile and made a report upon the treatment of its bars and the approaches to the new lock at the Assuan dam. He made also, for the same minister, an examination of the Sudd question south of Khartoom, and the possibilities of carrying a railway embankment across the Bahr-el-Ghazal. In consequence he was at Assiut and at Assuan during the construction of those two monumental dams, whose principles are incorporated into his project. The Assiut Barrage of Egypt supports on alluvial foundations a 40-foot head of water. But the Assuan, on rock foundations, is the model for the writer's similar sluice barrages on the Panama Canal. The Assuan dam controls the floods of the Nile, which are six times those of the Chagres. This is likewise the model for his Gamboa, Alhajuela, and Cano under sluice dams.

Senator MORGAN. What are the foundations underlying the pier at the Assuan dam?

Mr. BATES. Granite.

Senator MORGAN. You have gone down to granite everywhere?

Mr. BATES. Yes, sir.

Senator MORGAN. How deep?

Mr. BATES. About 45 or 50 feet.

Senator MORGAN. Below the surface of the Nile?

Mr. BATES. No; that was after the water was drained off. That was below the surface of the land.

CHINA.

Later the speaker went to the Philippines and China. He visited the latter country twice, for here, on agreement with an English company, he had arranged to examine the problem of the lower Yangtze and seek some better system for getting transports up the river and the 350 miles of gorges.

He examined also, while in China, and prepared plans for the Whang Pu. The Chinese call its bar their "heaven-sent barrier," and Europeans for fifty years have been trying to get it remedied. It may be recalled that one of the stipulations in the treaty of peace closing the late Boxer rebellion was that the Whang Pu River should be made safely navigable.

On his return to Europe he received a letter from Oberbaurath Franzius asking his collaboration. The letter states that the German Government had, before the signing of the treaty, bidden the Baurath study the Wang Pu and make them a project for its relief. He suggested that since Mr. Bates's proposed treatment coincided with his own they unite an alliance of representatives from other countries to make an international board. This was done. The members included Prof. W. H. Wheeler, M. I. C. E., of England, a leading author and authority on tidal rivers; George De Thierry, German Government member of the board of the Suez Canal and professor of hydraulics in the University of Berlin; Von Weber Ebenhoff, of Austria, professor of hydraulics in the University of Vienna; J. H. Apjohn, esq., M. I. C. E., builder of the famous Kiddepore docks, at Calcutta; M. Duforny, chief engineer of Ponts and Chaussées, of Belgium, designated by his own Government, and the late M. Zakaroff,

builder of Dalny, designated by the Russian minister of foreign affairs. The project thus accredited is before the Chinese Government.

JAPAN.

The speaker also twice visited Japan, going three times along the coast by water, stopping to study the ports, and once through the interior to inspect the country.

The writer is a member of the Western Society of Engineers, of the Civil Engineers of France, of the Civil Engineers of Belgium, of the Institute of Naval Architects of London, and other technical societies.

GALVESTON GRADE RAISING AND ERIE BARGE CANAL.

Later the speaker returned to the United States and established an office in New York. Galveston was proposing to raise its city grade. Your committee will recall that the town in 1900 was swept by a disastrous tornado which cost its population 6,000 lives and a property loss of \$34,000,000. A sea wall of concrete was built along the Gulf front. But the authorities decided to insure against all possible recurrence by lifting the city bodily above the flood line.

The problem became how to bring material for the district to be filled. To fill by cars was so costly as to practically rule out this method. The quantity (12,000,000 cubic yards) was three and a half times that removed from the New York subway. Water and gas pipes, street-car lines, houses, etc., had to be kept available for continual use. No dredge could pump the distance and height necessary. Two hundred and fifty contractors were invited to tender. Two contractors did tender. The speaker devised a method of driving a canal into the heart of the city and then, by use of a type of self-propelling dredges never before employed in this country, bringing in material and distributing it. The speaker's bid for the work was 40 per cent below that of his one competitor. The Galveston grade raising is now well advanced. The sand under the plan devised is taken from the Government channel, incidentally creating an improvement to it of \$1,500,000 value.

The recent New York barge canal law dedicated \$101,000,000 to the new Erie Canal. There have been let at this date six sections. Of these the company of which the writer is president has three, aggregating 21 miles of canal length. This construction includes rock excavation, earth work, piling, concrete masonry, dams, etc. Two dredges of 1,000 horsepower each and a large amount of other plant are under construction for it at the New York Shipbuilding Works. There has been introduced on it the first Lobnitz rock cutter ever used in America.

This company has just been awarded the Buffalo port-improvement work undertaken for the United States Government.

Senator KNOX. What is the name of your company?

Mr. BATES. The Empire Engineering Corporation.

Discussion of Panama Canal projects.

NEW SEA-LEVEL MAJORITY OF CONSULTING ENGINEERS—85-FOOT LAKE-LEVEL MINORITY OF CONSULTING ENGINEERS AND CANAL COMMISSION—SYSTEM AND PROJECTS OF LINDON W. BATES.

DISCUSSION OF ATLANTIC HARBOR PLANS.

[Diagrams on supplemental sheet, Fig. I, majority plan; Fig. II, minority; Fig. III, Lindon Bates.]

Both of the harbors recommended by the advisory engineers are inclosed by an east-and-west breakwater. Both are approximately parallel to the axis of Limon Bay, but are toward the east or Colon shore.

The *east breakwater* is common to both schemes—an arm run out to the 40-foot contour from Manzanillo Point. Immediately off its outer end and only a few hundred feet to the northward is a dangerous cluster of rocks and reefs carrying but 22½ feet of water. These in “northers” break heavily and induce a jumble of swift currents and backwash, hazardous to a steamer seeking haven in dark and stormy weather. The Board is united in presenting as a harbor feature this perilous reef right under the lee of wind-lashed vessels. Ships that in storm or blinding rains miss the narrow entrance ought to have sufficient sea room to avoid piling onto such hidden jagged peaks, but this would mean approximating the entrance to Harbor III. Safety to navigation should be a keynote in the harmony of the best canal scheme.

Further, the Board’s mile-long eastern arm receives the high trade-wind waves, driven often by vicious squalls, not at right angles to its axis, but obliquely.

The West Indian “norther” and hurricanes and gales come nearly always not out of the north, but from about the north-northwest. This condition of wave exposure compels, for the breakwater, a large cross section and extra heavy blocks of stone or concrete, else the fiasco of the early Galveston jetties must be but repeated.

WEST ARM.

The majority indicate a west breakwater 3¼ miles long from Mindi point. The minority one 4½ miles long from Mindi mouth. The sailing course here is almost due north.

The West Indian “norther” comes nearly always (as was noted) not out of the north, but from about the north-northwest. This is why Toro Point partially shelters the safest anchorage in Limon Bay. The charts of all nations show this and all admiralities officially admonish mariners of it. To this shelter vessels first scurry from the danger of reef-bound Colon. The eroded shore contours of Manzanillo Island bear evidence of the inroads of past cyclone-made breakers. Do these attested facts and the deep mud bottom mean nothing to the course, design, construction, and maintenance of at least the outer 3 miles of the west arm? The minority (p. 68), the Commission (p. xviii), and the chief engineer (p. xx), before undertaking these, their planned breakwaters, have misgivings. They all make reserves and would wait and experiment with the situation for

some years. Crested rollers at least 25 feet high must assail obliquely the 3-mile flank of the west arm, founded in mud. Solid 20-ton rock blocks are not obtainable on the Isthmus, with which to make safe these sponsored and half-sponsored and temporized harbor-defending walls. They stretch $4\frac{1}{2}$ and $5\frac{1}{2}$ miles long. But no one ventures to even guess at the heights from their crests to the deep unknown mud-buried bases of their outer 3 miles. Is it meant to bring granite from the States? Are concrete blocks intended? There is neither sand nor concrete available. It would take argosies of ships to carry sand, cement, or 20-ton blocks of stone from any source of supply. This is the breakwater situation.

Neither party, though the Spooner act calls for adequate and equipped harbors, presents a design or vouchsafes a detailed estimate. Both use the same round sum, \$5,000,000 (majority report, p. 58; minority estimate, p. 425). Though the writer's figures are characterized as over low, he observes that the minority for the inner end employ a unit price which is *half* his own. (P. 425, minority item, gives \$0.75 per cubic yard, and Bates's, p. 264, item 23, \$1.50 per cubic yard.)

The majority and minority, after these long breakwaters and reef-bound entrances, have here a salt harbor only and a terminal city 2 miles from the best canal entrance built over an unfilled swamp. If the terminal were removed under their plans to Mindi, it would still remain surrounded by morasses.

A personal inspection of the head of Limon Bay convinced the writer that Mindi is the best canal entrance when properly defended. It eliminates two sharp curves and shortens by several miles the total canal length.

Jaramillo Hill, between a fresh-water lake and Limon Bay, is the best location for the terminal city, and a course nearly midway across the bay the best approach to Mindi from the bay entrance.

The approach in Limon Bay—shown on the plate (Fig. III), was chosen by the writer because:

First. The 45-foot contour of deep water came farthest into the bay there according to the charts then existing. By the Coast and Geodetic Survey chart, completed November, 1905, the 45-foot contour is seen to be almost equally distant from Mindi by any approach. So this first reason for the approach as planned by the writer is no longer leading, but it is still retained because of his additional three reasons:

Second. This location is well away from the dangerous reefs.

Third. It gives a curveless entrance to Mindi.

Fourth. It points into the eye of the heaviest winds and wave motions, not somewhat obliquely as in the majority and minority approach.

The open approach through Limon Bay to the short inner breakwater founded in shallow water is subject to one question—resilting. There will be so little of this that dredging is better than building expensive breakwaters or jetties.

First. No river will enter the bay; hence there will be no river deposits.

Second. There is no evidence of any littoral drift to speak of. Having eliminated these, there is left only the deposits to be expected

after a heavy storm. Large hopper dredges will keep an approach deep and wide for far less than the interest and maintenance of the harbors created by the Board and minority's $3\frac{1}{2}$ and $4\frac{1}{2}$ mile breakwaters.

The channel proposed by the Board and minority is but 500 feet wide. The channel advocated should be 600 feet wide to the basin below the Balboa lock. Six hundred feet, in an exhaustive examination made at Durban, South Africa, was considered by the authorities the least that should be provided for a harbor-entrance channel. It is expected that the works of maintenance will gradually enlarge the Bates channel to the preferred width of 1,000 feet.

Senator HOPKINS. You say 600 feet is the limit. Do you give the reasons anywhere in your statement that you are now making?

Mr. BATES. Yes, sir; you will find those later. I will say that that examination was made by Sir Charles Hartley and others, and the Durban entrance is one of the most difficult entrances in the world to maintain.

Senator HOPKINS. You are making that suggestion, as I understand it here, as a criticism upon the recommendation of the 500 feet by the majority and minority report of the engineers here?

Mr. BATES. Yes, sir; it is a navigation question of the passing of ships under steam.

Senator HOPKINS. You set out somewhere in your statement the reasons in detail why the 500 feet will not do and why the 600 feet should be adopted?

Mr. BATES. Yes, sir.

Five hundred feet is too narrow for very large ships to pass each other safely without reduced speed, whether going in opposite or in the same directions.

In the Balbot location there will be first of all a well-protected salt harbor. The city will be newly and properly built from the beginning upon American soil; not upon that of Panama. Its site will be healthy. Protected behind Jaramillo Hill on the fresh-water lake there can be an impregnable naval station. There will be also here the fresh-water harbor—Lake Chagres.

The superior safety, usefulness, and convenience of Balboa Harbor and approach and basin to merchant and naval vessels can not be disproved, and it will cost far less than the other proposals. By their own figures, which, as has been shown, are seriously underestimated, the breakwater of the majority costs \$5,000,000; that of the minority, \$5,300,000; that of the writer, \$1,000,000, exclusive of dredging.

Senator HOPKINS. If it does not interrupt the thread of your discourse, I would like to have you point out here on your maps the situation as proposed by the minority and majority and yourself, so that we can get a picture of the situation where you are going to save over four millions, according to your statement.

Mr. BATES. Yes, sir. That is the harbor terminus of the minority [indicating on map]; this is the harbor terminus of the majority, and here is the harbor terminus which I have recommended, an outer approach here, and, in about 20 feet of water, a breakwater there, defending the approach to the basin in front of the lock. That gives you, then, the three ideas.

Senator HOPKINS. Do those black lines across there indicate a proposed breakwater [indicating on map]?

Mr. BATES. That is simply what I used in the discussion as being a breakwater that I would not construct; but I would construct this one by preference [indicating on map].

The CHAIRMAN. Mr. Bates says that if you will permit him to get through with his statement he will explain all these features. He would like to continue until he finishes his statement.

Mr. BATES. Yes; when this is printed there may be questions to be asked, and they can be more easily answered at that time.

EXCAVATION FROM MINDI TO GATUN.

The majority excavates along the old canal line, digging down to 40 feet below sea level. The minority cuts a new line through a series of hillocks made of hard clay. They both figure upon digging the "indurated clay" or "clay rock" with a hydraulic dredge.

Inquiry has developed the fact that except at the intersection at the mouth of the Mindi the minority had in hand from there to Gatun, a distance of nearly 4 miles, not a single boring on which to base the estimate to which all their responsibilities are attached. There exists neither a profile of the surface nor one of the indurated clay. Their new line is away to the eastward of all the canal excavations of the French company, and therefore away from all accurate knowledge of actual strata.

Senator HOPKINS. How far away is it? You say they had the French borings that covered that. Now, how far is the proposed line of the minority, where you say there are no borings?

Mr. BATES. It varies from nothing to about half or three-quarters of a mile.

Senator HOPKINS. Is the formation there such as, in your judgment, to require additional boring at that distance?

Mr. BATES. Yes, sir; and as I read on I will show you why.

Senator HOPKINS. Very well.

Mr. BATES. The majority concede 2,357,154 yards of refractory material in their own line to mile 5.49. The line of the minority is closer to the Sierra Quebrancha Hills; hence it is, certain naturally to encounter *more* refractory material. But its sponsors claim to have in their excavations between Mindi and Gatun *less* indurated clay than that which the majority concede. The writer declines to credit that the minority has figured in enough refractory excavation. He concludes from a careful study of all available data that between Mindi and Gatun especially the quantities allowed by the minority are far too small.

From an examination of all pertinent maps and a familiarity with the history of the abandoned French diversion, and from the accuracy of the data of the majority on the old canal alignment, remembering that on this section the minority project is *over three times* as wide as the sea leveler's project and runs amid clusters of small hillocks, it becomes almost a certainty that the indurated clay in the minority's estimates is vastly underrated, but by what amount no one knows. When the line is actually surveyed, if it ever is to be, and bored, it will undoubtedly be found that they will have *over double* as many cubic yards as they now contemplate of clay, refractory from a dredging standpoint.

Senator MORGAN. What do you mean by "refractory" in that connection?

(Mr. Bates exhibited to Senator Morgan a piece of indurated clay obtained from one of his borings.)

Senator MORGAN. I can not tell by looking at it. Can you describe it?

Mr. BATES. I mean that the capacity of the dredge will be so much reduced that the unit cost will be very high.

Senator TALIAFERRO. Is that one of the borings [referring to specimen of clay exhibited by Mr. Bates]?

Mr. BATES. Yes, sir.

Senator MORGAN. Why do you call it refractory?

Mr. BATES. I use that word from a dredging standpoint, as meaning a class of material which is exceedingly difficult to handle.

Senator MORGAN. Why is it difficult to handle?

Mr. BATES. Because a dredging operation consists in the first place of severing the material from its bed, and then in lifting it, and then in distributing it. In severing material from its bed sand is very easily severed, a certain variety of clay is severed with very great difficulty, and rock may have to be blasted.

The curve between Mindi and Gatun must be over 700 feet wide at the water line, and this expanse of indurated clay is located right on top of the hard, hilly knobs which stopped the French diversion excavations. The amount of indurated clay and rock is therefore manifestly underestimated. The minority merely guessed at it, for they had no borings or even surface-profile data.

Senator MORGAN. Your project has a dam across the Chagres River and the Gatun project also has one. What is the distance between the two projected dams?

Mr. BATES. Senator, I have a dam at Mindi and another one projected at Gatun. The one at Gatun is on the same axis as that proposed by the minority.

Senator MORGAN. The same axis exactly?

Mr. BATES. Exactly.

Senator MORGAN. Very well.

RECEPTION BASIN BELOW GATUN FLIGHT.

The minority report does not provide for a waiting basin below the locks, and their 500-foot waterway is inadequate for the reception of ships without one. The chief engineer points out this omission on the part of the minority. The writer, you will note, provided it in his presentation. The chief engineer remarks (letter, Jan. 26, 1906, p. 20):

"I believe, however, that the construction of a large basin or inland harbor at or near Mindi, or at a convenient location which exists below the Gatun dam, such basin to be supplied with coaling and other proper outfitting facilities, will be found advisable; the material excavated in the construction of such a basin is to be used in the construction of the Gatun dam."

This widening is needed near the locks. There it will be a mile or more from the lower margin of the Gatun dam. It will be thus beyond the limits of direct hydraulic dredge-pipe distribution and lift to the height required for utilizing its material in the dam. This

basin will have to be excavated last, after the channel reaches its location; otherwise a special channel half a mile long must be dug to it eastwardly from the old canal, in order to give the floating plant water access to the area to be dredged. Such a canal will likewise cross and interfere with the Panama railroad.

The material dug from this widening must therefore be transported in the same fashion as all the rest of the approach to the Gatun locks, viz, by scows. They must be towed back down the newly dug channel and then up the old canal or through an expensive and inconvenient cross channel. This has not been estimated either. Some of the material might be pumped *twice* to get it to the foot of the dam, first into the old canal bed and then into the lowest parts of the structure; but the quantity of direct excavation and distribution that can be done by such a method is limited to a relatively unimportant amount by the great length of the dam and the height to which the material must be hydraulically lifted.

The writer consistently sought to avoid, and did avoid, having to dredge much "indurated clay" and "Mindi rock."

The Board adopted some unit prices, which assign to this material to be dug by an "hydraulic dredge with cutters" 70 cents per cubic yard. Board report, page 419:

"It must be remembered that any estimated price is necessarily only approximate and should be made high enough to guard against errors, and will then be high enough to cover small variations from average conditions. It is recommended that the prices be used broadly."

Dredging:	Cubic yards.
Mud and sand in Colon and Panama harbors.....	15
Soft material removed by hydraulic pumps in canal.....	25
Indurated and hard clay requiring cutters.....	70

In the Colon Harbor bids last summer one firm, practical and experienced in the art of dredging by suction and with other types of dredging machines, spent months of time and thousands of dollars investigating and boring. Annual Report Isthmian Canal Commission (p. 251):

"The chairman read a communication from the chief engineer, dated December 29, 1904, respecting the conduct of Mr. C. W. Sturdevant, agent of the Atlantic, Gulf and Pacific Company, who had been given permission and assistance in taking borings and gathering special information regarding the harbor at Colon, asking in reference to course to be pursued when such agents decline to return the courtesy and refuse to give data so obtained. The matter was referred to the chairman for reply."

Then in a competitive tendering, for which this company thus fully prepared bid \$1.50 per cubic yard (vide Engineering Record, June 24, 1905), another bidder with no serious basis of preparation nor time enough accorded bid 76 cents.

QUANTITIES AND PRICES, OUTER APPROACH TO GATUN.

The writer set forth a price for outer and inner dredging of 0.167 cents; the majority and minority allow but 15 cents per cubic yard (vide pp. 50, 262, and 425). The writer spread his 0.017 cents over 20,600,000 cubic yards, which makes thus \$350,000, or ample for the

extra cost of handling by special methods and mechanism the deposits of refractory material underlying the soft upper strata between the shore and Balboa or first lock on the line he selected.

The following are the comparative excavations as estimated to Gatun:

Comparative table of excavations to Gatun.

[From report of advisory board.]

Project.	Earth.	Indurated clay.	Total.	Remarks.
<i>Sea level.</i>				
0 to 3.92.....	<i>Cubic yds.</i> 2,781,668	<i>Cubic yds.</i> 5,566	<i>Cubic yds.</i> 2,787,234	Pages 50-51. Pages 50-51 (23 per cent clay). Estimated 1,750,000 per mile.
3.92 to 5.49.....	7,696,885	2,351,588	10,047,473	
5.49 to G.....	(?)	(?)	2,905,000	
Total.....	(?)	(?)	15,739,707	{0 to 5.49 official. 5.49 to G estimated.
<i>Minority.</i>				
0 to 4.55.....	8,300,000	.....	18,300,000	Page 425, report.
4.55 to G.....	10,000,000	2,030,000	12,030,000	
Total.....	18,300,000	2,030,000	20,330,000	
Bates.....	20,600,000	α \$350,000	20,600,000	Page 262, report.
Naval basin.....	1,500,000	.....	1,500,000	Page 264, report.
Clearing old canal to Mindi.....	1,000,000	.....	1,000,000	
Total.....	23,100,000	α \$350,000	23,100,000	

α Extra allowance.

An analysis of the conditions and of this table shows that in the Bates project the estimates to Gatun for total excavation are higher than in any other. But the dredging character of this excavation has been so beneficially diminished by putting the first lock and dam at Mindi, thus creating a lake, that but \$350,000 has had to be allowed for handling refractory clay.

The majority has against this, 2,357,154 cubic yards, at 70 cents equals \$1,950,007, and the minority has against this, 2,030,000 cubic yards, at 70 cents equals \$1,421,000.

It is a safe conclusion that the estimates of the Board, and especially of the minority, for this sea-level end work are quite *two to three million dollars* too low. The minority apparently allowed nothing for the needed reopening of the old canal near Mindi mouth, for which the estimates of Project B provided \$150,000.

The lake between Balboa and Gatun in Project B purposely eliminates nearly all canal dredging between these points. What must be done is of the upper soft material. Hence it follows that up to Gatun the Bates estimates are far safer than the others and are correct as contract rates.

THE GATUN DAM.

The official description of the minority reads as follows:

Board report, page 69: "It is intended that the downstream toe of the dam for about 200 feet shall be composed of rock obtained from excavation in the canal prism, so that if there should be any seepage of water through the dam, there will be material at the toe which can not be washed away. *The lower part of the dam up to elevation 50, or even to elevation 80, is to be made from material dredged from the*

canal between the Gatun locks and Limon Bay, pumped by a suction dredge into the dam, the process being similar to the sluicing process employed in the construction of some important dams in the western part of the United States. By this process it is feasible, when using a material like the alluvial material at Gatun, which contains both coarse and fine material, to separate the two and to deposit the coarser material toward the downstream slopes, forcing the finer material to the extent desired into the upstream portion of the dam. An embankment built in this way will be water-tight."

"For the upstream slope rock obtained from canal excavations will be dumped as riprap, care being taken to provide an ample thickness at and near the level where the dam will be exposed to wave action. The portion of the dam above elevation 80 will be built of impervious material to a few feet above the water level, and at higher levels may be made of either earth or rock, as most convenient. It is expected that for the upper part of the dam spoil from the Culebra cut will be used."

An analysis of the foregoing (for their detailed estimates, see p. 425) shows, with reference to the works of the +85 plan, that—

First. There is to be dredged to Gatun—

Mile 0 to 4.55 (Mindl)-----	earth--	Cubic yards 8,300,000
Mile 4.55 to 7.15 (Gatun)-----	do-----	10,000,000
Mile 4.55 to 7.15-----	clay rock--	2,030,000
Total-----		20,330,000

Second. There is to be pumped into dam from barges—

To elevation up to +50-----	Cubic yards 12,170,000
To elevation up to +80-----	5,770,000
Total-----	17,940,000

The balance of the dam, 3,260,000 cubic yards, is to come from the lock site and other sources like Culebra.

Thus, we see that 17,940,000 cubic yards are to be dredged, put into barges, taken to the foot of the dam, and "pumped" to the stated elevations.

The detailed estimate is this (Board report, p. 425):

Excavation of channel in Limon Bay, 40 feet in depth below water and 500 feet wide from mile 0 to mile 4.55:		
Earth (dredging), 8,300,000 cubic yards, at 15 cents-----		\$1,245,000
Excavation 40 feet in depth below water and 500 feet wide from head of Limon Bay (mile 4.55) to northerly end of Gatun locks (mile 7.15):		
Earth (dredging), 10,000,000 cubic yards, at 25 cents-----	\$2,500,000	
Indurated clay (dredging), 2,030,000 cubic yards, at 70 cents-----	1,421,000	
		3,921,000
Excavation for Gatun locks (mile 7.15 to mile 7.74):		
Earth, 920,000 cubic yards, at 40 cents-----	368,000	
Indurated clay, 2,740,000 cubic yards, at 70 cents---	1,918,000	
		2,286,000
Gatun locks exclusive of excavation and approach walls-----		13,075,000
Approach walls of Gatun locks-----		500,000
Back filling and embankment, Gatun locks, 660,000 cubic yards of borrowed earth, at 50 cents-----		330,000

Gatun dam:

Earth embankment—	
Below elevation 50, 12,170,000 cubic yards of dredged material pumped into dam, at 20 cents	\$2,434,000
Between elevation 50 and elevation 80, 5,770,000 cubic yards of dredged material pumped into dam, at 30 cents	1,731,000
Above elevation 80, 3,260,000 cubic yards of material from excavations placed in dam, at 25 cents	815,000
Excavation for diversion channel and regulating works:	
Earth, 1,100,000 cubic yards, at 40 cents	440,000
Indurated clay, 480,000 cubic yards, at 70 cents	336,000
Concrete in regulating work and for protection of diversion channel, 189,000 cubic yards, at \$8	1,512,000
Regulating gates and machinery complete	320,000
Allowance for preparatory work at site of Gatun dam and miscellaneous expenses	200,000
Total for Gatun dam	7,788,000

The following is the schedule of unit prices (Board report, pp. 419, 420):

Dredging:	Cubic yards.
Mud and sand in Colon and Panama harbors	0.15
Soft material removed by hydraulic pumps in canal	.25
Indurated and hard clay requiring cutters	.70
Coral rock	1.50
Rock drilled and blasted in the dry to elevation —25, removed by dredge	1.50
Rock removed under water	2.50
Dams:	
When placed in dam by pump from barges below elevation +50	.20
When placed in dam by pump from barges above elevation +50	.30

Now, the material in Limon Bay is very light and soft. A rail used for sounding penetrates many feet by its own weight. It is not proposed by the Commission to provide the breakwaters at present (see letter.) This means that the water of the bay will nearly always be too rough to permit the use of dipper or clam-shell dredges or suction dredges discharging into barges. It will require the employment of self-propelling, self-contained hopper dredges of large size and special design, fitted to discharge their silt cargoes ashore when the vessel has steamed to Gatun. But the minority has not figured on such craft here at all. The writer is operating half of all that exist in the world, at Galveston. The old canal does not, unless redredged at considerable expense, provide water for the large fleet of such boats necessary to dredge and transport, say, 5,770,000 cubic yards of material between mile 0 and Mindi mouth, and the price, 15 cents, is wholly inadequate for such a performance.

Again, the new line leaves the old canal just above Mindi mouth. It bears to the east and runs straight into the cluster of hard knobs and low hills of Mindi Gap. These introvertibly contain indurated clay and the hard clay rock which the French found there in making their Mindi excavation.

Senator MORGAN. Why did the French make that excavation there?

Mr. BATES. That was to get a straight alignment to Gatun, sir. It was simply a question of alignment and dodging the hills.

Senator MORGAN. It was out of the side of the hill?

Mr. BATES. Yes, sir. I will show you, Senator, the actual shape of the hill on these models later.

The new cutting of the minority is 500 feet wide on the bottom and 660 feet wide at the surface. One may see from the Maltby profile some of the hillocks rising to 50 feet above sea level. The cutting in places will be 810 feet wide. At the curve (mile 5½) it must be still greater, and the material must inevitably be largely refractory. Now, first, the top material, with roots and vegetation, will not deposit well or easily in barges if an attempt be made to load such by hydraulic dredges.

Second, hydraulic dredges with cutters can not excavate the Mindi rock clay at any price warranting the consideration of their use there. Much of this material will have to be drilled and blasted, or Lobnitized, and the naïve proposition to dredge this refractory clay and rock by means of a suction dredge with cutters and put it into barges is, to one with first-hand experience in building and operating, simply preposterous.

Senator HOPKINS. How much of that has got to be blasted there?

Mr. BATES. Either blasted or Lobnitized on that approach—possibly 4,000,000 yards.

Senator HOPKINS. What length?

Mr. BATES. It is about 3½ or 4 miles.

Senator HOPKINS. It will have to be blasted for a distance of 4 miles?

Mr. BATES. No, sir; do not understand me that way, because the material varies. You run into a group or cluster of small hillocks that stick up from the surface of the morass, and there is where you find indurated clay.

Senator HOPKINS. How much of that 4 miles distance will, in your judgment, have to be blasted?

Mr. BATES. I should say at least half a mile would have to be blasted, and yet there are other methods for severing the material from its bed which may be employed without blasting.

Senator KITTREDGE. I understand that you cover all these questions in your statement?

Mr. BATES. Yes, sir; that is all covered in my statement a little later on.

Senator HOPKINS. It is a little more intelligible to me to get at it now.

Senator MORGAN. Has any great geologist ever attempted to account for those hillocks that appear in that morass?

Mr. BATES. I think a French geologist claimed that that Mindi Range was a later uplift. Whether it was or not I do not think anyone can tell or know.

Here is a sample of the clay rock from Mindi. Such material must be severed from its bed and put into barges by a dipper or, preferably, by a multiple-bucket dredge. Under such machines much of the stuff deposited into barges will be in large lumps, in sizes up to a cubic yard or more. The material is manifestly in no condition for being "pumped from the barges into the dam." It must be granulated first mechanically. To such service the cutters of a suction dredge at the dam stations are not suited. The writer knows of no way for effecting this save by cumbersome and untested process of stamping, crushing, or granulating.

Now, assuming even that this sequence of operations was actually effected (but, be it clearly understood, assuming it a moment for argument only) and that the stuff was mechanically prepared for the dam, we have to consider next where pumps are to be located, and, further, their relation to the work they have to do, viz, lifting this prepared material through heights of 50 and 80 feet, for the minority's Gatun dam is to be 135 feet high.

The macerating and pumping stations (in numbers, since 5,000,000 cubic yards are expected to be handled per annum) must be located below the center of the east and west sections of the dam. For the east section the old canal affords access; for the west section barges must come up to the junction of the old canal and the Chagres opposite Gatun, then go down the Chagres, then up the old west diversion a distance of 2 miles. This old bed and diversion would have to be made navigable at considerable expense, for they are not deep enough for the service demanded by the barges and tugs.

Next, we are met with the fact that nowhere ever yet has material been pumped to a distance of 2,000 feet and then lifted higher than 35 feet. Beyond that combined distance and lift everything is experiment. Theoretically, centrifugal pumps may be compounded or siamesed, but no one in the whole wide world has had the experience which would give any warrant for resting the execution and the estimates of time and money for this dam on the basis put forward by the minority and approved by the Commission.

Nowhere can a single instance be cited; nowhere can a satisfying demonstration be named. It is nothing short of monstrous to jauntily rest this national enterprise upon untried methods, vastly beyond the range of experience and past success.

In his testimony, the chief engineer (p. 900 of the investigation of Panama matters by the Senate Committee on Interoceanic Canals) supports this treatment. So much the worse.

The material dredged between Mindi and Gatun does not have to be taken "to the deep sea and dropped," as he declares. The marshes each side afford ample spoil areas. It is far more practical to haul Culebra material and build the dam in layers, thoroughly wet and rammed down, but this is another task. Spoil must then be rehandled from the trains and be lifted far above the present railway grade in the valley.

Assuming, however, next, that this structure, containing 21,200,000 cubic yards, were built, it would normally sustain the lake proposed. But it could not, of course, be earthquake proof, not fissure proof, nor subsidence proof.

Senator HOPKINS. There is nothing that could be earthquake proof, is there?

Mr. BATES. Oh, yes. In Japan they build a light wooden house instead of a huge masonry structure, and they prefer to live in safety in a little wooden house than in danger in a masonry structure. That is an earthquake country.

Senator MORGAN. They had an earthquake in 1888, of which a full statement from the daily papers is in the record of the former examination—a very fearful earthquake that extended clear over from Panama to Colon and tore the houses down, displaced steel railroad bridges, and then appeared near Bocas del Toro in little volcanic pits,

throwing hot water and steam. That was in 1888. Recently they had another one opposite the islands of Galapagos, just below that on the South American coast, that reached across the continent to Cartagena. We need not discount the earthquakes in this proposition at all.

Senator HOPKINS. I did not mean to interrupt Mr. Bates in his statement.

The CHAIRMAN. Proceed, Mr. Bates.

Mr. BATES. Against these risks the minority center the whole availability of the canal in this one feature. The waterway in any eventuality to the dam would be useless until it could be restored. But restoration would be a dredge, barge, and train work not of months, but of years. A crevasse must carry out millions of cubic yards and scour a chasm many scores of feet, under the portion carried away, and for a long distance downstream. Nothing could stop it. The refilling of the lake alone would require nearly a year. Further, the high level made by the dam is less convenient for ships than a lower level, because each must be lifted and lowered every transit through a total of 45 unnecessary feet.

Senator KNOX. Excuse me for interrupting, but it does not seem to me that this is the most profitable way of getting at your facts, Mr. Bates. How much of this matter is there to be read? We could only get a very superficial notion of it by having you read it, and if it is going to be printed it seems to me that if you have anything definite to say about your own plan as contradistinguished from the others it would be more illuminating to point it out on the maps and designs here, rather than merely to read what you have prepared.

Mr. BATES. If you would prefer, I will come right to that point now. In fact, I have reached the point where I think it would be pertinent to do that, Senator. I will, from now on, point out on these maps as I read. I have come to just the point where I should like to do that.

Senator DRYDEN. I should like to have Mr. Bates, in his remarks and procedure here, treat this matter, so far as I am concerned, at least, as if it were entirely new, for Mr. Bates's plan is new to me. I would like to have him take it up de novo, and so explain it that we who are not scientific men—at least I am not in this line—can have this matter put before us so that we can clearly understand his plans.

Senator KITTREDGE. As I understand, the purpose of Mr. Bates is first to criticise the plan of the minority, and I anticipate that he will later explain his plan and show why it is preferable.

Mr. BATES. Yes, sir.

Senator KNOX. My point is that the reading of something which we are to have in our hands later on, when we study this proposition, is a waste of time. If he gets up and shows us what is wrong with the minority and majority schemes and what is right about his, as contradistinguished from them, I think we would get some more intelligent impression about it.

Senator HOPKINS. I want to know if I understand the Senator from South Dakota correctly, that Mr. Bates comes here simply to criticise the minority plan?

Senator KITTREDGE. No; that was not my statement.

Senator HOPKINS. You said something that gave me that impression. That was the impression I received from the remark that you made.

Senator KITTREDGE. The substance of what I said was this, that thus far Mr. Bates has devoted himself to the criticism of the minority plan.

Senator HOPKINS. Yes.

Senator KITTREDGE. And I assumed that a little later he would state his own plan and compare the two.

Senator HOPKINS. Has he any views regarding the majority plan?

Mr. BATES. Yes, sir.

Senator HOPKINS. And was it his purpose to present views regarding that also?

Mr. BATES. Yes, sir.

The CHAIRMAN. I think it would be better if Mr. Bates were permitted to finish his statement first and then have the questions asked afterwards.

Senator HOPKINS. I want to get a little knowledge about this so as to follow it. Is this witness impartial between the majority and the minority—that is, to the extent that he condemns both?

The CHAIRMAN. I rather think that will be the result when he gets through. Then he will give his own plan, his own ideas as to the canal.

Senator TALIAFERRO. I think that the time has come for this committee to decide whether we are going to consider the plan submitted to us here or whether we are going to take up entirely new and different plans. If we are going to take up new plans for this canal it seems to me that we should make it known to the public, so that anyone who has a plan to submit may bring it here. If we are going to open this question up for new plans, instead of considering the matter that has been committed to us for consideration, it seems to me that it is only fair to all who may have plans for a canal that they should be given the opportunity of coming before the committee and submitting their plans.

Senator KNOX. That suggestion, I think, has a great deal of merit in it. It was the suggestion that I made the other day in opposition to calling Mr. Bates at this time. I thought that we had a specific work laid out for us, and that was to determine as between the reports of a great board of engineers, one a majority and one a minority report, which we would recommend—not for us to prepare a plan or to call in outsiders and to indorse an outside plan.

Senator HOPKINS. Was your plan submitted to this board of engineers, Mr. Bates?

Mr. BATES. Yes, sir.

Senator HOPKINS. The same one that you are elaborating now to us?

Mr. BATES. Yes, sir.

Senator TALIAFERRO. It was submitted to the board of engineers, as I understand, and condemned or rejected in detail.

Senator HOPKINS. Is that correct, Mr. Bates?

Mr. BATES. Yes, sir.

Senator KNOX. You would hardly expect us, Mr. Bates, a body of laymen, to take up a matter and decide it as between you and this board? Do you think we could do it intelligently?

Mr. BATES. Senator, all I should say is this: I think that by the time I have submitted what I have here—and I have only begun the real objections—that you will be very willing to consider something else besides the majority and minority plan, whether it be mine or any plan that anybody else can advance.

Senator MORGAN. Mr. Chairman, there is no doubt at all that the first duty of this committee is to determine between a sea level and a lock canal as to the general plan, and, after that, to take up the statements of experts in respect of the best type of canal to be executed on the plan we select. That, I think, is the proper course for the examination. In determining between a sea level and a lock canal we have before us a fully detailed exposition of the lock plan that was recommended by the minority of the Commission. I say recommended; I so understand it. They took that plan of a lock canal as a fair comparison, as I understand it, between the lock system and the sea-level system. They adopted that as a standard of comparison. But I do not understand that the report of the committee or the message of the President committed either of those functionaries to the adoption of the particular plan for a lock canal that was set out in the minority report.

Mr. Bates's testimony as far as he has gone is a criticism upon the plan that was used by the Commissioners and referred to the President and to the Isthmian Canal Commission for the sake of illustration, and probably with the expectation of its being finally adopted. I think that the criticisms he is making upon the lock plan as proposed are important, for the reason that it may turn out that that lock plan as inadmissible and can not be adopted; and while he is hammering down that plan, it may turn out that his plan will be hammered down by the same arguments. I do not know. But the inquiry as to the feasibility and practicability of the lock plan with a dam either at Mindi or at Gatun is a question that I think we are obliged to consider in determining the recommendation we will make as between the lock plan and the sea-level plan. That is my view of the present situation.

Whether we will go further and hear Mr. Bates explain his own plan is a matter that is within the discretion of the committee at the present time and at all times; but it seems to me, Mr. Bates having proceeded as far as he has, that it is proper to let him explain his plan throughout, particularly in regard to the dam at Gatun and the handling of the water at Gamboa, and also and perhaps more especially in regard to the Pacific terminus of the lock canal that he proposes, which is entirely different from that of anyone else that I have as yet heard speak upon the subject.

So I think, as we have proceeded with Mr. Bates's testimony as far as he has gone with it already, in justice to him we should let him complete his statement and then we will take into consideration whether we will have any more of the same kind of testimony.

Senator TALIAFERRO. I did not mean to make any objection to Mr. Bates concluding his statement. He has been invited here by the committee, and courtesy would require that we give him a hearing, after inviting him here; but I do think, instead of taking up our time listening to his reading of the statement, that it might go in the record, and he might explain by these maps or profiles he has here what his objections to the majority and minority plans are.

The CHAIRMAN. I think that is what Mr. Bates is trying to do, if we will let him proceed; but if it is desired that we take the matter up in a different way, it can be done at this time. Mr. Bates was certainly invited to come before the committee. The names were—

Senator KNOX. I think we all agree with Senator Taliaferro that we do not desire to shut Mr. Bates off. It is only a question as to the method that he shall employ in instructing us.

The CHAIRMAN. I take it that Mr. Bates desires, before he gets through, to give us his objections to the majority as well as the minority report. I think he wishes to criticise both.

Mr. BATES. Yes, sir.

Senator HOPKINS. I heartily approve of the suggestions of the Senators that the essay part of this statement be printed, where we can read that with the other matters, and that he give us the practical part, by taking his pointer and indicating on the profiles and maps here, taking up these different plans and suggesting and pointing out their defects.

Senator MORGAN. I have not discovered that Mr. Bates has indulged in any essay. I think he is making a very pointed statement of the engineering facts that bear very strongly upon this question.

Senator HOPKINS. Well, each Senator is responsible for his own understanding, of course.

The CHAIRMAN. Shall Mr. Bates proceed?

Senator MORGAN. I hope so.

Senator KITTREDGE. I agree with Senator Morgan. I would like to hear Mr. Bates.

The CHAIRMAN. Proceed, Mr. Bates.

Mr. BATES. It will be carefully noted that in the project B the writer has not undertaken to lift a cubic yard beyond the limits that have been actually and many times reached. When a Gatun dam is being built for his +62.5-foot summit level of B there will be a working level *made by Lake Chagres* at 33.5 feet, and there is, therefore, free and immediate access to every inch of this structure.

Further, the 35 feet of the extra height of 50 feet above the water line in the +85 Gatun dam does not add to water tightness. Instead, it does load the soft clay foundations and increases the danger of subsidence.

GATUN UNDER-SLUICE BARRAGE.

The minority, as well as the majority, at Gamboa and Corozal now adopt the under-sluice barrage to control the level of their +85-foot lake, abandoning the over spillway of the former +85 Lake Bohio project from the Giganté. The chief engineer has discovered a new over spillway site, for which he disclaims credit, up the Trinidad Valley, where the hollow of a saddle is "27 feet" above the lake. The writer sees no advantage in considering and substituting this locality, remote from the dam, when the central island and the sag next the west abutment of the dam offer a near and convenient rock-bottom foundation, as the borings show. The writer welcomes this tribute, though unavowed, to his insistent advocacy that the central principle of the Assouan dam be applied to isthmian conditions. He merely takes occasion to point out that under-sluice structures for an 85-foot head are larger and more expensive than for his similar works

of about one-third the head. The proposals of the writer are more safe, because the head is lower and they effect the same result.

MINORITY'S GATUN LOCK FLIGHT.

The minority's dangerously conjoined three Gatun locks are stated to have usable lengths of 900 feet. These lock lengths are 790, 790, and 820 feet on the official plans they have themselves put out, and which are indorsed by the Commission and the Secretary of War.

Here is a relief which I have had made of the Gatun dam and the lock site as it actually exists, to natural scale. This is the flight of three locks. Here is the upper lake [indicating on map], and this is the dam. There is the west abutment, and here is the Gatun hill.

The upper approach wall will be either founded in soft alluvium or must go 140 to 170 feet below sea level for rock. These locks can never be enlarged, because there is no room for enlargement in the hill. A Cunarder 788 feet long is to-day in process of construction, and a 788-foot ship can not safely venture into a 790-foot lock.

Here is an actual model of the ship, and this is taken from the official map [indicating map]. And there you see your vessel just fills your lock. She has 2 feet clearance. There is the Cunarder in that lock. This is taken with the greatest possible accuracy from the official plans.

The locks of the 85-foot canal recommended by the minority are obsolete before they are begun.

After reviewing the situation in some detail (pp. 36 to 40) the majority adopt the following (p. 40):

"That the locks on a canal of any type should be of such usable dimensions as will afford a length of 1,000 feet, a breadth of 100 feet, and a depth of 40 feet. It is further considered that if the canal were formed with smaller dimensions than these experience would prove it to be regrettably deficient in capacity."

On page 13 of the Board report is the following:

"As a basis for all plans the Board resolved, by 11 affirmative and 2 negative votes, that locks should have as a minimum usable dimension a length of 1,000 feet, a width of 100 feet, and a depth of 40 feet. The two members voting in the negative were Messrs. Noble and Ripley."

Now let us see what the minority of five and the Commission indorsed. Their report reads (p. 81):

"We believe this allowance for reasonable anticipation excessive, and that locks 95 feet wide, with a usable length of 900 feet, will fully meet the requirements of the act for both commercial and war ships, and recommend the adoption of these dimensions."

Page 82 continues:

"If the locks should prove, after many years (*after many years*), to be too small, larger ones can be built when needed," etc.

The minority therefore announce locks 900 feet long and enlargeable when needed. Inspecting the official map put out by the minority, and scaling the contours and structures, it is noted that practically the best and only feasible location has been chosen.

Senator HOPKINS. There would be no trouble, would there, in the minority changing their plan to a thousand-foot lock?

Mr. BATES. Yes, sir; that is just what I am coming to. The axis of the lock can not be swung advantageously, nor moved to the west nor to the east. Why? Because you get into bad country.

Senator HOPKINS. At the bottom there there is a hill, is there not? Why can they not go that way?

Mr. BATES. Because then you come into such tremendously deep cuttings. The hill rises right up.

Senator TALIAFERRO. Not deeper than the cutting at Culebra?

Mr. BATES. No; it is not. That height right there is 150 feet. It is 135 feet right in here [indicating on map].

Senator KNOX. That relates to the width of the locks. How about the length? What is the difficulty about that?

Mr. BATES. Just one moment until I get those profiles before you, Senator.

Senator KNOX. If you treat of it later on, do not stop now. I withdraw the question for the time being.

Mr. BATES. I do; yes, sir. I have brought the things that prove it.

So far so good. Next we measure what purports to be a 900-foot lock in the clear, and a flight of three locks 3,136 feet from end to end. We scale the plans and the locks and what do we find? Where are the 900 feet of minimum usable dimensions? The measurements give 790 feet in the clear—some 50 feet longer only than the discarded plans of 1901. Where are the locks of the minority, which wrote, "They will fully meet the requirements of the act for both commercial and war ships?" But perhaps they can still be saved and enlarged. We seem to remember reading "If the locks should prove, after many years, to be too small, larger ones can be built when needed." They are sorely needed. Can they be built?

Senator DRYDEN. Do you mean to say that the report of the Commission is false in that respect?

Mr. BATES. I say that their location and the official plan to which they have subscribed shows locks that are but 790 feet in usable dimensions.

Senator DRYDEN. While they claim them to be 900 feet?

Mr. BATES. They have not shown it, sir.

Senator KITTREDGE. The question was: "They claimed them to be 900 feet?"

Mr. BATES. Yes, sir; they claim them to be 900 feet.

Senator MORGAN. While those profiles are being examined I will ask you about your statement that the Commission begins with locks that are already obsolete. Do you mean in reference to ships that are projected in Great Britain or ships that exist in America?

Mr. BATES. They are obsolete with reference to the law which requires that there should be a full anticipation of the needs of the future. We already have a ship within 2 feet of as long as that lock.

Senator HOPKINS. It is a 790-foot lock, is it?

Mr. BATES. Yes, sir.

Senator HOPKINS. There is a difference of fact, as I understand it, between you and the minority. The minority claims that those locks are 900 feet, and you say they are 700?

Mr. BATES. I say they show but a 790-foot lock.

Senator HOPKINS. And they say they show a 900-foot lock?

Mr. BATES. Yes, sir.

Senator HOPKINS. It is simply a question of fact between you and the minority, then?

Mr. BATES. It is a question as to whether they can get a 900-foot lock into that hill at all. That is the question.

Senator HOPKINS. They say they can, and you say they can not?

Mr. BATES. Yes, sir.

Senator HOPKINS. Then it comes back to the proposition that you disagree with them on a question of fact?

Mr. BATES. Yes, sir. Here, as you notice, is the approach to the lock [indicating on map]. There is the depth to the lock under this approach. From the top there to the rock line is 234 feet. There is a lock that is scaled absolutely from the official plan [indicating]. There is a real 900-foot lock [indicating]. Here is a 1,000-foot lock of the majority placed in the best position on the hill [indicating]. You see what happens. There is no foundation for it. There is room in Gatun Hill for one lock, and there is not room for three with proper rock foundations. That is the whole story.

Senator TALIAFERRO. The minority say here, Mr. Bates: "We believe this allowance (that is, of the majority) for reasonable anticipation excessive, and that locks 95 feet wide, with a usable length of 900 feet, will fully meet the requirements of the act for both commercial and war ships, and recommend the adoption of these dimensions." Further, they provide for ships nearly double the tonnage of the *Dakota* and *Minnesota*, or 25 per cent larger tonnage than the projected Cunarders.

Mr. BATES. Yes, sir. You can see, taking it on their official plan, that that is not true. Here is an actual size Cunarder [indicating model], and when I put it into the lock which they have made there is not room, as you see [showing by means of model]. You could not safely put the ship in there. So that that statement is untrue.

Senator HOPKINS. You put that in on your dimensions. You have made the lock 790 feet instead of 900 feet.

Mr. BATES. I have taken that lock from their official plan on the actual scale. If you will look at the plan you will find it is exactly the same. There is no difference. I think somebody has made a mistake.

Senator MORGAN. They probably adopt the American limits for the capacity of the canal instead of the universal limits. If they do, I am with them. [Laughter.]

Referring to the profile which is presented, the top figure is the lock flight as laid out and approved for the 85-foot plan by the minority and the Commission. The relation of this unexampled mass of concrete to the firm rock of the hill is shown. All the borings which they had to go on, or which are now in the Government possession at Washington, are presented to you. How many, think you, there are? Four—one, two, three, four—borings. *Four* on the hill and *one* in the *valley*. These are all. These constitute the explorations for foundations to this unprecedented and unparalleled flight of locks. But they are still enough, however, to show that there is not safe room in their hill for the 3,136-foot flight of short locks and the 1,200-foot approach piers at each end, which the minority have put on paper.

On this same profile there is shown a lock 900 feet in the clear (to use the nomenclature of the isthmian report of 1901) in the best

position practicable. Below it, again, is a lock really 1,000 feet in the clear.

Now, note where the rock lies under the upper approach pier (figs. 2, 3, and 4). This pier is the structure along and against which vessels weighing 40,000 tons are to moor and to lie. The top is, say, 9 feet above the lake, or at +94. It is 1,200 feet long, five times as long as the Trinity Building in New York, and nearly as high above the rock as its twenty-first story is above Broadway. At its outer end, where the contours show the water to be 80 to 85 feet, the distance from the base at the rock line to the top of this structure is 234 feet. What is to be said of such a plan? Will the minority put this concrete structure on soft clay, or build an array of Eiffel towers? Besides, if the proper distance is to be maintained between an entering and a departing ship, there should be *two side approach walls*, not merely *one central wall*.

Figure V shows another position with 1,000-foot locks. Under the outer end of the upper pier the rock is 264 feet below its top. In position IV, the lock entrance of the minority, at the bottom is 20 feet above the rock, and the mass of entrance masonry, which contains the "safety" gates, must be 45 feet high above the rock and supported by "back fill." At the other end the next set of gates is incased in concrete 46 feet high above the rock. With the central lock it is about the same.

It is therefore revealed that there is safe room in Gatun Hill for one lock and its approach piers, the latter to be founded on rock within feasible foundation depth. But there is not room for a flight of *three locks* large enough to comply with the law of Congress or even large enough to pass the new Cunarder of to-day.

If, then, there is not space in the hill for even three abridged locks, how are bigger ones to be installed?

The drawing shows a Cunarder in a lock of the minority's dimensions. There is no margin. The letter of the Commission says (p. 17):

"The minority point out that the dimension proposed by them will provide for ships having 25 per cent more tonnage than the new Cunarders. If ships too large for these locks should hereafter be developed, it will be possible to add new and larger locks to accommodate them."

Was the writer disclosing a fact when he said the minority's lock, and hence the minority's canal, as officially presented and indorsed, is obsolete before it is begun?

DISADVANTAGES OF LOCKS IN FLIGHT.

It is not practicable to use a divided lock when two or more are conjoined. This the minority concede.

You see a vessel entering a lock leans its shoulder, so to say, against this approach. If, coming out of the lock, she comes against this central pier, a vessel entering and a vessel departing of this great size are in too dangerous proximity. Therefore I say that there should be side approaches instead of relying on one central one there, in order to reduce the total amount of concrete in that position. My contention is that there is not room enough in Gatun Hill nor either side of where they put their locks to put in a flight of three

locks even of the size of the one they have projected—790 feet long—much less one 1,000 feet long, and that they can never enlarge it.

Senator TALIAFERRO. I do not see why they can not extend the length of those locks. You have not made that clear at all to me.

Mr. BATES. Just look at the profile there.

Senator TALIAFERRO. Point it out on the map with your stick.

Mr. BATES. That is not a profile, sir. This is a profile [indicating]. That is a plan of the lock, and this is an elevation. That is the boring point there. There is another one there, and there is one there and one here [indicating]. Those are all the borings on that site. Then we have one more showing that the Gatun gorge, the deep trough, passes under the end of the approach pier. That is what makes it so deep down to the rock.

You see that position there in the hill that the lock is right close to the brow of the hill there, which is as near as it can be put with safety. I tried putting it nearer in this plan here, and you can see what happened. If you will look closely at this model, you will see a 1,000-foot lock superimposed directly over it. See how much longer it stretches. There is the end of the lock here and there is the end there [indicating on map]. If you lengthen your lock, you move the position of the upper gate toward the brow of the hill and the approach wall is put out so far, and the distance from the bottom of the canal to the rock below becomes so great that, so to say, your whole lock structure is on stilts.

Senator TALIAFERRO. Why can you not go on down to the rock bottom?

Mr. BATES. If you want to go down with unlimited money.

Senator TALIAFERRO. It is not a question of cost, but of safety.

Senator HOPKINS. Your objection is not that there can not be a three-lock system, but that it is going to be expensive, then?

Mr. BATES. It is going to be expensive and absolutely hazardous; and not only is that true, but—

Senator HOPKINS. How can it be hazardous if you can get to a rock bottom?

Mr. BATES. Can you get to a rock bottom there, at 140 feet—

Senator HOPKINS. That is for you to say.

Mr. BATES. I say no.

Senator HOPKINS. How deep would you go down there?

Mr. BATES. I would go with but one lock. That is in the project—

Senator HOPKINS. Yes; I withdraw that question. You are now criticising the three-lock system of the minority?

Mr. BATES. Yes, sir.

Senator HOPKINS. Does their system of locks extend out into the bay there as you have pointed out on your map?

Mr. BATES. Precisely. That is directly from the official plan.

Senator HOPKINS. Yes. How far out into the bay does it go on that projection?

Mr. BATES. That projection, from there to there [indicating], is 1,200 feet.

Senator TALIAFERRO. So that you withdraw your statement, or modify your statement, Mr. Bates, that those locks can not be lengthened in that position, and substitute for it the statement that they can not be lengthened without great cost?

Mr. BATES. Not without very great cost and without very great increase of hazard.

Senator HOPKINS. What do you mean by "hazard?" Hazard in what way?

Mr. BATES. The hazard relates to having your foundations at great depth and the great difficulty of reaching those foundations.

Senator HOPKINS. As an engineer you concede that it can be done, do you not?

Mr. BATES. I concede that you can remove mountains if you have money enough.

Senator HOPKINS. We are not talking about mountains now, but we are going the other way. You concede that they can go down 140 feet to rock?

Mr. BATES. No, sir.

Senator HOPKINS. Then you deny that they can do that?

Mr. BATES. Yes, sir; satisfactorily, with a concrete structure of that weight and height. It is below the limits of possible pneumatic work. The best that has been done so far is about 90 feet.

Senator TALLAFERRO. Then you adhere to your proposition that it is impossible?

Mr. BATES. Yes, sir.

Senator KITTREDGE. Will it interrupt you if I ask you a question?

Mr. BATES. No, sir.

Senator KITTREDGE. In regard to these foundations. Have you read the testimony of Mr. Stevens, the chief engineer?

Mr. BATES. Yes, sir.

Senator KITTREDGE. Do you remember his statement in regard to the foundation of the locks proposed by the minority and him?

Mr. BATES. I do not recall the statement; no, sir. You mean as to where he would locate his locks?

Senator KITTREDGE. No; where the foundation of the locks would be.

Mr. BATES. No, sir; I do not recall it.

Senator KITTREDGE. I will look it up in Mr. Stevens's testimony. You need not stop on my account. I will look it up while you are speaking.

Mr. BATES. My position in regard to locks at Gatun and their practicability is that there is ample and safe room, on easily reached rock foundations, for one long lock and its approaches, and that there is not room for these three short locks and no room for further enlargement.

Senator HOPKINS. Did you point that out to the engineers in presenting your plan?

Mr. BATES. No one ever dreamed of a three-lock flight at Gatun when that plan went in.

Senator HOPKINS. When your plan went in?

Mr. BATES. Yes, sir; here is another point I want to mention: The disadvantages of locks in flight. It is not practicable to use a divided lock when two or more are conjoined. By divided locks we mean a long lock with an intermediate gate.

Senator HOPKINS. What do you mean by an intermediate gate?

Mr. BATES. If you have a lock a thousand feet long, you put an intermediate gate, so that you can either lock a vessel 400 feet long or one 550 long. That is the point.

Senator HOPKINS. They do have such, do they not?

Mr. BATES. Oh, yes. They have been provided in all the single locks that have ever been considered for Nicaragua and Panama.

Senator KITTREDGE. I have found what I had in mind in Mr. Stevens's testimony. Will it interrupt you if I read it here?

Mr. BATES. Not at all.

Senator KITTREDGE. I read from page 978 of the testimony of Mr. Stevens, chief engineer:

"Senator GORMAN. Under that plan (referring to the lock plan of the minority) the foundation of your lower lock must be, of course, below the sea-level part of your canal?

"Mr. STEVENS. Yes, sir.

"Senator GORMAN. What sort of a foundation can you get for this immense structure?

"Mr. STEVENS. Clay.

"Senator GORMAN. You would trust that lock on a clay foundation, would you?

"Mr. STEVENS. Yes, sir."

Mr. BATES. Well, I will explain. Here is a sample of the clay that he had in mind. [Exhibiting sample of indurated clay.] It is a very great misnomer to call this clay. We lack a name. I got that boring when I was at the Isthmus, and that is the indurated clay rock. When you taste it, you get the characteristic taste of clay; but it is exceedingly hard and dense, and forms a splendid foundation; and that is the clay rock all through Gatun Hill. It is when you reach this stuff that you have got something which he calls clay.

Senator DRYDEN. Do you agree that that would be a sufficient foundation?

Mr. BATES. Oh, splendid; nothing better.

Senator KITTREDGE. You say that that is the clay that Mr. Stevens refers to?

Mr. BATES. Precisely.

Senator KITTREDGE. And at what depth do they go to reach that?

Mr. BATES. In these borings on the Gatun Hill, right on the verge of the hill, you see [indicating on map], we find it at about 20 feet. Then it drops off immediately into the Gatun Gorge, which is 208 feet deep on the side and 258 feet deep on the other, as shown by your profiles.

Now, then, this submerged gorge—there is the island right in the center here [indicating on map]—has one path leading right across this way and another one leading in that direction, and this approach pier comes over the gorge, and the brink of the hill is right on the edge of it. Then the rock line runs from 20 to 30 feet under the surface down the hill and goes under the morass, and all the way to Mindi, so that your upper 20 feet between Gatun and Mindi is soft and easily dredgable material; and as soon as you get into indurated clay of this character you have to use a different kind of plant from what you would use on the upper material.

I was just about to speak about the disadvantages of a flight of three locks when two or more are conjoined.

Vessels seeking transit will range from the little coasting steamer to a 1,000-foot liner. In the lock plans of the minority the whole of each lock must be used at each passage. This is a great waste of lockage water, which in the future may prove serious. It takes

more than double the amount to pass 50,000,000 tons of shipping if the locks are separated and the divided-lock principle can be employed. This is because 85 per cent or more of the steamers can pass, by using one of the sections into which the long, single locks, proposed by the writer, are divided. Thus it comes that the tonnage capacity of the Bates projects A and B is *double* that of the +85 with the same expenditure of water, under ordinary conditions of dispatching vessels across the Isthmus. The minority's and the Commission's +85 plan, therefore, is most decidedly inferior, and, for the future, menacingly inadequate. The Board, in selecting their +60-lock plan, put a lock at Bohio, and thus threw away, because they had not considered the Mindi lock site, 43 per cent of the lockage water which the rainfall of the region supplies.

Here is the situation: In order to have the greatest capacity for the lock canal at the Isthmus you have got only all the water that falls on the Isthmus and no more. From Bohio down no more lockage water would be available than that which fell on the watershed above Bohio. If you put your lock at Gatun, you get practically all the water on the Isthmus, except from a little watershed of the Mindi. Consequently it is bad to limit the lockage water supply on the Isthmus.

There can not be any more natural lockage water than the clouds give. This is distinctly limited, as the records reveal.

Furthermore, if the locks are separated and are themselves each divided, it becomes possible to use the lock either in *full* lifts for the extra long ships or in *half* lifts for 85 per cent of the commerce. When the *half* lift principle is utilized but half as much water is used up; and here again the divided and separated locks of the projects of the speaker can pass double the tonnage of the +85 scheme, and are by so much more decidedly superior to all the others. It is a sure conclusion that the divided and separated lock system of "B" gives *four times* the ultimate canal capacity of the +85 project.

I never would put but one lock in a location. I believe a flight of locks of two or three is dangerous. It is all right for small canal boats, but when you are dealing with masses of thirty or forty thousand tons' weight you must have room to stop the ship. You have only to go up on the Hudson River, at one of the piers there, and see a big ship coming in, to realize the force of the momentum of one of those large vessels.

The speaker's divided lock has, besides the ordinary safety gates and provisions for cutting off flow, a gate intermediate in the lock chamber, dividing it into usable sections, say about 425 and 550 feet long. Thus it comes that the intermediate gate is a *real* safety gate. When one considers the momentum of a great 40,000-ton ship, the safety gates of the minority are too close together (only 80 feet apart). Time and distance are required to stop such vessels. Consequently the divided lock is the real way of security from over-running.

In safety the locks planned by the writer are decidedly best and are free from the certain hazards which attach to the flight of three *abridged* locks on Gatun Hill, each already too small to pass a "new Cunarder" safely (much less the vessel "25 per cent larger"), which the minority submit and the Commission indorse.

Senator KNOX. Would it be contemplated to move these great vessels by their own power in that restricted space, or would they be moved by some other power—by tugs or some other appliance?

Mr. BATES. They could not be moved by tugs. They would be moved in part by their own power and in part probably by winches.

Senator TALIAFERRO. Steam winches?

Mr. BATES. Yes.

I am going to speak of the lower diversion channels of the sea-level scheme.

LOWER DIVERSION CHANNELS OF SEA LEVEL.

The majority's proposal includes diversion channels below Gatun on both sides of the canal.

Gatun-Manzanillo Bay division.—This artificial river is destined to carry the low-water and high-water flow of the watersheds of the Mindi and Chagres on the east side below Bohio. The area of the east and west drainage basins is not definitely known, but it is estimated at 500 square miles. The mean annual rainfall is 137.67 inches, with a recorded maximum of 205.61 at Bohio in 1898.

From this it follows that the mean run-off is approximately 3,694 cubic feet per second, or 77 per cent of the recorded flow past Bohio. For such a rainfall as occasioned the floods of 1879, 1885, 1888, and 1893 no observations or records exist to establish the volume contributed to the Chagres from its watershed below Bohio. Having regard to the known higher rainfall of this area, it seems eminently safest to reckon the contribution to be 77 per cent of the 140,000 cubic foot-seconds maximum conceded to have passed Bohio in 1879, or 100,100 cubic foot-seconds.

The streams from the east—the Gatun, etc.—are nearly the size of those from the west—the Trinidad, etc. The mountain source, back of Porto Bello, is higher. Therefore we may take it that at least half, or 50,000 cubic foot-seconds, may in emergency come from the east and 50,000 cubic foot-seconds from the west.

That the flow in this diversion shall not exceed 6 feet per second, above which velocity the diversion banks will seriously erode, the diversion must have an area of $\frac{50,000}{6} = 8,333$ square feet. But this equals a channel as large as the canal itself. If it be 20 feet deep, it must be 417 feet in average width.

Technically such volumes mean, with the small diversion channel proposed by the Board, either—

1. The velocity of the escaping flood must seriously and irregularly erode and damage the banks of the diversion and the septum separating these rapid flowing waters from the navigated channel, or

2. The impounding of a large lake in the lower valley of the Gatun-cillo higher than the channel between Gatun and Bohio. This lake would be separated from the canal channel by a narrow levee 8 miles long, liable to crevasses from overtopping, to subsidence into the swamp mud, or to perforation by animals.

Senator KITTREDGE. You mean the channel of the canal?

Mr. BATES. Yes, sir. It either must escape past Gatun through the channel or it will pile up and come against the levees separating the canal from the low area.

The only relief from this condition must be found in a larger diversion or in a very long under-sluice dam connecting the Gatun spur and the Tiger-Lion group of hills, thus creating another lake basin from which water could be suffered to pass out gradually.

The meager data quoted on page 186 of the report regarding the flood records to 1889 for the Gatuncillo and Trinidad rivers apparently fall far short of an 1879 maximum.

On the west side, while the old Chagres bed affords a large enough way for the overflow of the high permanent lakes filling the valleys of the Cano, Giganté, and other streams, and the floods of the Trinidad, the western diversions should have a large cross section to assure a proper factor of safety. Hence it follows that the majority provisions—technical, financial, and for maintenance—for this 14½ miles of eastern diversion are wholly inadequate.

It would take a canal passing Gatun 20 feet deep and 417 feet wide, or a channel equal in area to that of the main canal itself, to carry off the flood water coming from the Gatuncillo watershed in the case of such a flood as that of 1879.

The writer subscribes to the view that the Commission in adding but \$6,500,000 to the sea-level estimate was very conservative.

MINDI GAP AND RANGE AND CHAGRES RIVER BELOW GATUN.

The advisory report refers in these terms to these first vital land features encountered beyond Limon Bay (pp. 25 and 26):

"It early became apparent that additional information was desirable relating particularly to the possible dam and lock sites at Mindi, Gatun, and in the vicinity of La Boca. The Board requested the Isthmian Canal Commission to have further examinations made, as follows:

"1. On the Mindi line the examination to be topographic with respect to the ridge line to the east of the Mindi through to Jaramillo Hill, thence to the shores of Limon Bay, in order to develop any low passes communicating with the Chagres River, and over the Jaramillo Hill near the high ridge line to the Chagres River and across the same, connecting with the high land to the west of the Chagres. This examination to be carried up to elevation 50."

With reference to the Mindi location, Mr. F. B. Maltby, division engineer, reported:

"On the west side of the canal the high ground is continuous from the Jaramillo Hill to the Chagres River. * * * From a personal examination I am quite sure that a point can be found in this vicinity where the distance across the Chagres Valley to an elevation of at least 50 feet is not more than 3,000 feet."

You observe that the Chagres, after passing Gatun, runs in a narrow valley with numerous spurs running down from either side. Neither the French nor any American commission has ever made a survey or boring in there. I have had it examined myself.

"I think it more than probable that surveys would develop a possible crossing of a shorter length. On the east side of the diversion at Mindi the hills are simply isolated knolls for a distance of half a mile east from the diversion channel. From these there is a continuous ridge which is very much broken in elevation, but in which

there is no point which has an elevation of less than about 40 feet." * * *

You have this hill here [indicating on map], and between this hill and Mindi is a succession of nine knolls rising to a height of 50 feet; and they are from 100 to 200 feet apart.

"It therefore seems possible that should such a project be contemplated, a dam might be built from the Jaramillo Hills across the canal, connecting the various hills as far as the east diversion opposite Mindi. From there, for a distance of half a mile, it is probable that a dam, having a base at an elevation of only 5 or 6 feet above the sea, would require construction for half the distance. In addition to this there would be a dam across the Chagres River of about 3,000 feet in length."

In the Maltby report the asterisks represent the following omitted sentences:

(1) "This is the first hill on the right that we saw when we went down the Chagres River."

(2) "I have not had the time to prepare any maps showing this work, and, in fact, after what we have done is plotted it will show very little on a map, as it is simply a single line run irregularly, keeping at all times on the high ground, where such ground existed."

There is also the following unpublished letter:

ISTHMIAN CANAL COMMISSION,
DEPARTMENT OF ENGINEERING AND CONSTRUCTION,
OFFICE OF DIVISION ENGINEER,
Cristobal, October 26, 1906.

Gen. GEORGE W. DAVIS,
Chairman Consulting Board of Engineers,
Washington, D. C.

SIR: I have the honor to inclose herewith blueprint of a map, scale 1:3,000, from the vicinity of Mindi River to Gatun.

This map shows the results of some recent investigations made concerning the possibilities of a dam at Mindi and a possible relocation of the Panama Railroad to mount the elevation which would be created by the construction of the Gatun dam.

There is also a profile showing the elevation of the ground along the line B or from the west side of the canal at Jaramillo Hill to continuous high ground on the east.

Also a profile along line A showing a possible relocation of the Panama Railroad.

As stated in my letter of October 21, the Jaramillo Hill is continuous to the Chagres Valley, and the crossing of the Chagres Valley proper can be had with a length of not over 3,000 feet.

Very respectfully,

F. B. MALTBY, *Division Engineer.*

Copy to chief engineer.

The report details, page 124:

"Thursday, October 5, the members of the Board took train at 8 a. m., proceeded to Mindi, where they disembarked and climbed the hills to the eastward of the canal overlooking the country, and examined possible sites for locks and dams; returned to the train and

proceeded to Gatun, where the hills in that vicinity were climbed and a view of the country obtained.

"Messrs. Davis, Abbot, and Quellaennac, accompanied by General Ernst, went by train to Gatun, thence by launch to the mouth of the Chagres River, thence by sea to Limon Bay, skirting the west and south shores of the bay to the mouth of the Mindi; entering the same, proceeded through the canal to Gatun, and, returning over the same route, passed out again into the bay and returned to the ship.

"The weather during the first five days of the stay of the Board on the Isthmus was exceptionally pleasant, thus facilitating the excursions that have been recorded. On Monday it commenced to rain, and the rains continued remittingly, but in large volume, until the Board left the Isthmus on Wednesday evening. The Board thus had an opportunity to observe the country under favorable conditions and also when the flow of the rivers was very much increased by the heavy rainfall."

An engineer detailed to examine the Mindi site for a terminal dam; therefore reported its width less and its configuration far more favorable than even the previous data had shown.

The advisory board made the cursory examination which its report recounts. At its request Mr. Maltby was assigned to make a simple reconnaissance without borings east and west from Jaramillo Hill and across the Chagres. Those on the Mindi dam site eastward from Jaramillo Hill indicate that indurated clay rock is comparatively close to the surface all the short way across. There is no Bohio or Gatun geologic gorge at the Mindi Gap, and nothing to prevent a masonry-core dam or a perfectly tight rock-and-earth-fill dam here, or the rock-founded under-sluice barrage, as projected by the writer. He also found that to dike the Chagres and make the 35.5-foot lake there was needed a dike *only 3,000 feet long*.

That is the place where the French first encountered rock, and which sticks up 70 feet above the water. Numerous borings have been made across that site, so that we know practically that the clay rock is closer to the surface there at Mindi than at any other dam site on the whole Isthmus, except one on the Pacific side.

Across the Chagres Mr. Maltby finds the crossing from hill to hill at the +50-foot contour, but 3,000 feet *or less* most probably. At Gatun it is 1,675 feet more, or 4,675 feet between these same 50 foot contours. There are 4 miles of the Chagres below Gatun practically unexplored as to dam sites; places narrower than at Gatun between spurs of indurated clay rock. What right has anyone to conclude that because it is 258 feet to rock at Gatun it is the same or more in these 4 miles of river coursing among jumbled hills and spurs on either side, which may be, and probably is, a later uplift?

The water-borne deposit being lower down the river, must be more dense and less pervious, no matter how deep. Be it remembered that the dry dock at Colon, so much quoted for its demonstration of the impermeability of indurated clay, and Mindi and the Indio, are closer to the sea than Gatun. The utilization of the Mindi Gap and the Chagres crossing is the key to the best lock canal.

This record, meager as it is, is nevertheless more than appears anywhere in French or American canal official publications. The advising engineers are pioneers, albeit they did not stop and go ashore

anywhere and conducted their explorations at 8 miles an hour in a launch, in a blinding rainstorm.

On October 5 the distinguished party, which alighted from the train on the eastward side of Mindi Gap, and a poor place from which to observe "possible sites for locks and dams," saw but little more of the sites, which the writer brought forward, than if they had remained in Washington. The district is an uncleared jungle, where the actual configuration of the ground is not visible a dozen yards away. The great advantage of a lake above Mindi makes a consideration of this site of vital necessity.

Here is the situation: In order that there shall be sufficient lockage water for the future needs of a lock canal the waters of the Chagres and all its tributaries must be impounded in a lake created below where the rivers Trinidad and Gatuncillo come in. A dam at Bohio does not include these tributaries, and so can not give sufficient lockage. Hence the impounding summit level dam must be at or *below Gatun*. The only way to impound below Gatun is across the Mindi Gap and Chagres Gap. If a two-lock canal is to be built, and it is the one most easily transformable into a sea-level waterway, the Atlantic lock must be either at Mindi Gap and Chagres or Gatun.

If a four-lock canal is to be made and the locks not placed in flight one above another, a serious combination and one most to be avoided where great ships are concerned, the locks must be at Mindi and Gatun.

There is no escape from these conclusions and never has been.

Senator KITTREDGE. Why is it necessary to depart from the proposition of the minority in regard to their plan in that regard?

Mr. BATES. The reason is simply that they have their locks in flight.

Senator KITTREDGE. What harm is there in that?

Mr. BATES. Very serious dangers of overrunning; and the very fact that you can not use the intermediate gates. That is, when you put your locks in flight you immediately reduce your lockage water. The single lock at Mindi and at Gatun gives the highest possible lockage capacity; and you limit your lockage capacity as soon as you put locks in flight, because you can not lock your small ships without using the whole lock, and consequently using up water. If you put in a torpedo boat you use more water than for a 1,000-foot ship where you have locks in flight. If they are not in flight, if they are separate and divided with an intermediate gate, then you can lock your small boat in half your lock, or two-fifths of it, just as you make your proportion. So that there are chances of the economy of the water where you have a separate lock system which do not obtain where you have them conjoined. So that the scheme of the minority with locks three in flight here [indicating on map] and two in flight at Sosa has about the least lockage capacity of any canal you could devise on the Isthmus.

Senator DRYDEN. Do you question the sufficiency of the water for this purpose?

Mr. BATES. Yes, sir—that is, I question the sufficiency of the water when you come to very large tonnage in the far future time. I think that for the first ten or twenty years, as I have shown in this book of mine, you will have ample water; but when you have a lock canal, you are committed to a lock canal. There is only one canal that can be transformed at any reasonable expense, and that is a two-lock

canal. If you have what is shown on this one here, a lock at Mindi and one where the majority has put it at Sosa, then you have, we will say, a lock canal at an elevation of plus 30 or 35 above sea level, one summit from lock to lock, and that is 40 feet deep. Then you are within the dredging limit. You can dredge to a depth of from 70 to 75 feet; they are doing that in the California mines now. That is the maximum dredging depth that I know anything about; so that it would be entirely feasible to transform a two-lock canal, but it is not feasible to transform, except at a very prohibitory expense, a canal with more than two locks. The water will get so deep in the lake that you can not dredge it.

Senator KITTREDGE. By a two-lock canal, do you mean a lock at either end?

Mr. BATES. Just a lock at either end. I made two projects—one of them with a lock at either end, making simply the end lakes, and another with four locks, putting one of them at Gatun and the other at Pedro Miguel. The reason for that is very simple. I can illustrate it by using the fingers of one hand [illustrating]. Your isthmus has four longitudinal ridges and consequently three valleys. If you turn to the old reports and all previous plans, you will see that they had a central lake at Bohio and a sea level. There are only four things you can do, and every scheme has to be some modification of those four things: (1) A sea level, cutting through all four of the ridges; (2) a center lake scheme, with sea-level ends; (3) a scheme with the two end valley lakes, or (4) the combination of the two end lakes and the central lake.

Senator TALIAFERRO. Why not go down from the Atlantic and have a sea-level canal on this side up to one side of the mountain, and up to that point [indicating on map], and from the foot of the mountain in the Culebra cut a sea-level canal to the Pacific?

Mr. BATES. Then you would have a lake in the center.

Senator TALIAFERRO. No; no lake.

Mr. BATES. Then you would have a sea-level canal all the way?

Senator TALIAFERRO. No.

Mr. BATES. Oh, this lake in there [indicating on map]? Yes, sir; that is a sea level all the way.

The plans I have just mentioned are the only four that can be suggested. Every other plan is some modification of one of those four plans. Before this time all the schemes of the French and of the Isthmian Commission that have been considered have had simply the central lake scheme. This scheme of the minority is the very first one in which an end-lake scheme appears.

Senator KITTREDGE. What did you characterize it? What sort of a lake?

Mr. BATES. An end lake; because they are at the two ends.

Senator MORGAN. Your plan contains four dams, if I understand it—one at Mindi, one at Bohio, one at Gamboa, and one at Miraflores. Is that correct?

Mr. BATES. No, sir; on the Panama side there is one dam at La Boca and a lock at Sosa Hill that creates a lake that I call Lake Panama. At this point, Pedro Miguel, is a lock and undersluice dam. At Gatun there is a dam; at Mindi there is a dam. That makes four dams across the Isthmus.

Senator HOPKINS. Whose plan is that—the four dams?

Mr. BATES. That is mine. The aggregate length of the two dams at Mindi and Chagres is not as great as that at Gatun. Then, a dam at Gatun. The level of this lake, from here to there [indicating on map], will be, say, plus 30 to 33. The level at Gatun is plus 62 above sea level. So that on none of the dams do I have a head of over 30 to 32 feet.

Senator MORGAN. You have no dam at Bohio at all?

Mr. BATES. No, sir; because I think that in putting a dam at Bohio you limit the lockage supply, so that I should utterly abandon that site. That is reason enough.

Senator HOPKINS. Have you investigated it enough to know whether there would be any difficulty in making a dam at Bohio?

Mr. BATES. I think you can make a Morrison type of dam—that is, combined earth-filled and rock-filled dam—at Bohio.

Senator HOPKINS. So that it would be all right?

Mr. BATES. Yes; you can build a Morrison type of dam at Mindi here, and at Gatun, and at Bohio, and over here—anywhere.

Senator KITTREDGE. Mr. Bates, why not put a double lock at Gatun instead of one at Mindi and one at Gatun, as you propose?

Mr. BATES. The objection I would have to that is this—there are two or three: In the first place I would like to make a combined salt and fresh water harbor. In the next place I do not want to put on any earth and rock fill dam on the Isthmus a head of over 35 feet.

Senator KITTREDGE. Why?

Mr. BATES. Because I think that it is not safe.

Senator KITTREDGE. In what respect?

Mr. BATES. If it should be shattered by an earthquake, for instance, you can repair a dam whose head is only 33 or 34 or 35 feet, because you can put material into that dam by mechanical means, but just as soon as you have increased the lift from that surface of the water on the dredge over 35 feet you have got into the realm of experiment where nobody has ever gone. I do not believe in making experiments, sir.

Senator KITTREDGE. You say “in the realm of experiment?”

Mr. BATES. Yes, sir.

Senator KITTREDGE. Do you mean that there are no locks with a lift aggregating 60 feet?

Mr. BATES. No; I do not know of any with that lift; but on the other hand, whenever you make a single lock that would lift as much as 60 feet you use an extraordinary quantity of lockage water. For instance, one of the early projects down at Panama was to have a lock at Bohio 100 feet high in one single lift. It was utterly given up because they recognized that every time you locked a vessel that only drew 24 or 25 feet you would be using up 75 feet of water under that ship.

It passes understanding, therefore, why this board and this Commission, like every one of their predecessors, have failed to grasp and act officially upon the supreme importance of *knowing* all there is to know of these localities and of any other possibilities that may exist yet undiscovered for shortening the canal or reducing its curvature in the narrow ridge from Jaramillo Hill westward.

There remains not one particle of doubt that by means of short, low, safe Mindi and Chagres dams, identical in their principles of construction with those advocated by Mr. Morrison and by the minority

and by the writer, a lake can be made with an elevation up to +33.5 feet, and possibly higher, below Gatun. And also there is no question that the foundations will be better than at either Gatun or Bohio.

With this conceded, Jaramillo Hill, the site of Balboa, becomes beyond dispute the best and only Atlantic terminus, which should be deemed permanent. It is surrounded by the fresh and salt water harbors, and its selection gives the *shortest canal course* between the two ocean dispatching stations *by 5 good miles*, over both the majority and minority Colon-saving schemes.

Colon is useful during construction; no longer; and Balboa will be a city wholly of these United States; not like Colon, located on foreign soil.

The writer concludes that up to Gatun there can be few dissidents to the adequacy of, and a preference for, his terminal city, dam and lock sites, and for the terminal lake and the naval station. It is certain that his contract estimates are fairer and safer than those of the Board or its minority.

GAMBOA DAM.

We have been brought by this comparative analysis and criticism to the high lakes, which the majority propose to create in the Valleys of the Cano and Giganté. One must yield the palm of originality to this engineering feature, which is to be found, the writer believes, nowhere before in the troubled annals of the canal's engineering history, for disposing of floods in the western watershed of the Chagres.

Two superfluous dams with the perpetual menace inherent in great permanent heads conceived to make lakes overflow their margins at spots never visited and never even surveyed. The idea is scintillant. It is a transference to new pastures of the old eastern impounding scheme of the last engineering committee with its great tunnel sub-way.

This heralded tunnel (smiled, be it noted now, out of court) gives place to an undersluice dam at Gamboa, much huger than the writer's, but of the Assouan type. (Vide remarks of the chairman on the occasion when the Board divided 8 to 5 on the type.)

"They (the floods) no longer menace anything or anybody, but the water serves a beneficial purpose by its distribution over agricultural land. One of the largest rivers in the world, the Nile, having a measured flood discharge many times greater than the gauged or estimated flow of the Chagres, has come under the complete control of men by works that were easily accomplished in less time than the engineers estimated.

"I have the feeling that the Chagres control will be easily attained in the sense we use the words respecting the attainment of large things, and that difficulty, to my mind, is of less and less importance as we better understand the conditions. A few years ago we knew little about it, but now the physics and hydraulics of this stream are probably as well known as those of any river in the world, and we can measure the due proportion and outlay for works for its control. It may, perhaps, cost as much as it did to make the dam at Assouan, on the Nile."

This has a familiar note. We quote from page 71 of the Bates presentation to the Board introducing the Assouan type of dam:

"In projecting dams of this type at Cano, Alhajuela, and Gamboa, as well as at Mindi and Sosa Barrages, cognizance is taken of this inspiring mile-and-a-quarter-wide demonstration that a continental river may be valved as a water pipe and may as perfectly perform its allotted task. The Assouan dam, however, had as its function to impound a large volume of clear Nile water and to let it out gradually during the irrigation season, after allowing the early silt-bearing floods to pass.

"The reversal of this duty is proposed by the author for the Panama sluice dams. What is here required is to catch and hold the high floods and, by maneuvering the sluices, let them run off gradually and harmlessly."

Also from page 93, Bates Report:

"By electrically manipulating their sluices the levels of Lakes Chagres and Panama can be raised and lowered. They can be reduced to a sea level or even below."

The volume per linear foot of such a dam at Gamboa varies approximately as the square of the head plus 45, the distance from the high-water mark to the rock line.

Hence we have—

Gamboa sea-level dam $(170)^2 = 28,900$.

Gamboa Bates dam $(109)^2 = 11,881$.

Alhajuela Bates dam $(109)^2 = 11,881$.

Cano Bates dam $(109)^2 = 11,881$.

But the three smaller dams are besides each much shorter than the high dam. It follows that the Gamboa, Alhajuela, and Cano dams of Project B, taken all together do not equal the monumental volume of the vast concrete structure proposed by the majority.

The writer deprecates dependence upon the integrity of one unit and believes that the world's experience in distributing risks over several units is profoundly wise.

EARTH AND ROCK FILL DAMS.

For purposes of comparison the following table is inserted:

Approximate comparative lengths and volumes of earth dams.

	Project B.			Minority +85.		
	Cubic yards.	Length.	Head.	Cubic yards.	Length.	Head.
		<i>Feet.</i>			<i>Feet.</i>	
Mindi.....	1,500,000	3,800	33.5			
Chagres.....	3,000,000	3,000	33.5			
Gatun.....	4,635,000	5,600	29.0	21,200,000	7,700	85
Pedro Miguel.....				1,100,000	2,000	30
La Boca.....	1,300,000	4,200	26.5	6,300,000	4,800	55
			36.5			65
Ancon-Sosa.....					1,750	55
						65
Ancon-Corozal.....				5,980,000	5,600	55
Total.....	10,435,000	16,600		34,580,000	21,850	

The sea level has over 60 miles of levees separating the canal from the diversions. Besides these continuous levees the scheme embraces high dams of *quite unknown and unmeasured lengths*, impounding great permanent lakes, in the valleys of the Cano and Gigante. The sea-level diversions are all exposed to erosion. Thus it appears that the 85 has one more earth dam than has "B." It has *four* dams with *several times* the net head and height. The minority dams are about 5,250 feet longer, and they total 24,145,000 cubic yards more than "B's." The minority use the same formula of design, but include at Gatun 35 feet additional height of debatable utility. Attention is invited to the graphic diagrams from Pl. VII of the Board's report disclosing comparative cross sections of the dams and their positions. No one can gainsay that the unit prices for building the small dams must be lower than for building the high ones. This is why the writer refuses utterly and emphatically to subscribe to a common scale of unit prices. A common scale is a sheer absurdity from an executive standpoint. But everyone seems to repeat this misleading error, and on this fallacious premise criticisms are based.

Means and methods of execution must and will differ with every plan. Prices will be very markedly determined by these means and methods.

ESTIMATES FOR SANITATION, ZONE, GOVERNMENT, ETC.

ESTIMATES.

Premise: Neither majority nor minority have included in the estimate for building the canal sanitation or Zone government. These items must be added therefore to their announced figures.

(Report of the Board of Consulting Engineers, p. 148:) "After considerable discussion of the estimates submitted in the report with reference to the 20 per cent allowed for contingencies, etc., Mr. Parsons moved a reconsideration of the following resolution, which was adopted during the twenty-fourth meeting:

"*Resolved*, That we add to the estimates based upon the unit prices the sum of 20 per cent for administration, engineering, sanitation, and contingencies, exclusive of interest during construction, expenses of the Zone government and collateral costs.

"The motion to reconsider the resolution was carried unanimously.

"Mr. Burr then moved to amend the resolution to make it read as follows:

"*Resolved*, That we add to the estimates based upon the unit prices the sum of 20 per cent for administration, engineering, and contingencies, exclusive of interest during the construction, sanitation, expenses of the Zone government, and collateral costs.

"The motion to amend was unanimously adopted.

"Sanitation, expenses of Zone government, and collateral costs. How much must be added?"

For the year 1905, with few or no men at work actually digging, and with less than half the force which will be apparently employed when excavation is really in progress, the above items were as follows:

Page 193, Annual Report Isthmian Commission, 1905: "\$828, 102.63, exclusive of \$355,001.48, for the 'construction of waterworks, sewers, and roads,' and exclusive of this department's pro rata of

'material, supplies, and equipment and cost of purchase, handling and transportation'—say, \$100,000 per annum. It would seem that during construction (whatever betide the department afterwards) a 'sanitation and Zone government' estimate of \$1,000,000 per annum for a lake canal and \$1,250,000 for the sea level is conservative. There is, therefore, to be added to the minority's total for its 85 scheme, 'nine years at \$1,000,000, \$9,000,000;' and to the sea level, 'thirteen years at \$1,250,000, \$16,250,000.' This at least. These sums added to the official estimates make the tally:

85 (minority estimate)-----	\$148,705,200
Sea level (majority estimate of thirteen years' execution)-----	263,271,200
Sea level (Commission estimate of eighteen years' execution)----	286,480,418 "

The President's message, February 19, concludes (page iv, letters transmitting the Report of the Board of Consulting Engineers for the Panama Canal):

"The law now on our statute books seem to contemplate a lock canal. In my judgment, a lock canal, as herein recommended, is advisable. If the Congress directs that a sea-level canal be constructed, its direction will, of course, be carried out. Otherwise the canal will be built on substantially the plan for a lock canal outlined in the accompanying papers, such changes being made, of course, as may be found actually necessary, including possibly the change recommended by the Secretary of War as to the site of the dam on the Pacific side.

"THEODORE ROOSEVELT."

Since the minority's waterway, by its own tally, exceeds the amount appropriated by Congress for a canal, it can not be constructed except after further Congressional action. Further, it does not appear in the estimates of the Board or Commission what credit is to be deducted for the \$26,500,000 already expended or bespoke for "equipment and supplies." Since these figures are dated "February, 1906," a deliverance is in order from the Commission and Board that \$139,705,200 minus \$26,500,000 equals \$113,205,200 minus \$23,284,200 (20 per cent contingencies) equals \$89,921,000. This represents, then, the real remaining sum. Do these engineers seriously expect to themselves or by contract complete the work for this price? Even if the Government should turn over the whole thing free of cost, work done, material, and supplies to the aforesaid alleged value, how is \$89,921,000 going to be made to cover the construction of their Panama Canal? These facts and figures must be set nakedly and truthfully forth if there is not to be a sad awakening perilous for the whole enterprise. A contractor is not privileged to bid a unit or lump price for "contingencies." He stands or falls by something definite, without benefit of clergy, and has no feather bed of 20 per cent, which is the haven of uncertain engineering where money estimates contain no personal financial hazard.

EVOLUTION OF CANAL PLANS.

Before he outlines his next group of criticisms he must make some general statements. The struggles between the two extreme types—the sea level and the high level—for Panama began at that far day which gave them both birth—the Paris congress of 1879.

There gathered to this congress one of the largest bodies of technical and scientific men that the world has ever assembled. Delegates were sent from the civilized globe—98 men in all. There sat in those sessions Sir John Hawkshaw and Sir Charles Hartley; Derks, constructor of the Amsterdam Canal; Voisin Bey, constructor of the Suez Canal; Waldorf, of the Swiss canals, and scores of the most prominent engineers then living. Our own Menocal and Selfridge were there, the first the intensest advocate the lock canal has ever had. To the technical subcommittee were submitted, as the congress record shows, some fourteen projects.

Each of the rival groups analyzed, sifted, eliminated, and finally amalgamated from the elements of these fourteen. The canals they respectively recommended represented the very highest and best that these two parties could evolve out of all the elements and all the projects thus far devised. They were buckling for the first great encounter in this arena of 98 men, and they omitted nothing which could strengthen their hand. They incorporated all the forces which could give them the mastery. If any feature was declined by its own party it was, to the best belief of that group, this feature, as then evolved, was to the canal, then and there planned, not desirable.

The two types locked horns in the general session, and the sea level won out. It entered upon its day, but its rival was not dead. The sea level never attained a supremacy so safe that it could lift its foot off the neck of its lock competitor. Commission after commission made through the years a continuous judgment bar. The struggle went on, yet neither quite vanquished and killed the other. Through this fight of over a quarter of a century we must believe that each steadily kept its gaze alert for every leverage and for every vantage. It has drawn from every known old source and from every new source sustenance and alliance. It has gathered unto itself strength when and wheresoever it might. It could have no conceivable purpose in declining and defeating any idea which could enlarge its power and hasten its triumph. If an idea was declined it was because this idea as then conceived was not deemed a good one for the canal as then projected. Its advocates could gain nothing by weakening their own cause.

It is therefore rational and just to believe that at every step of this long way the different guardians of the two types incorporated at the various stages all that they knew and all that they believed best for their ward types. The quarter century has been for each a gradual evolution. Out of the struggle came the survival of the fittest, and what stood September 1, 1905, as types for the sea-level and high-lock canals represented the fruitage of all that had gone before. When the Panama came into the hands of our Commissioners, two years ago, they had the legacy of twenty-five years in engineering history. Still anew the elements were studied, analyzed, sifted, eliminated, and amalgamated. As recently as seven months before the international board convened a latest report was made reviewing the high level and the sea level up to date. The high level was left unchanged by the Commission, and virtually in its then existing form was submitted to the international board. The sea level, confirming a last departure, a tunnel (see Report, page 10),

submitted also its latest and, as we must think its official advocates believed, best evolution.

These two types, therefore, came September 1, 1905, to stand before the final technical bar for the death throw. Either they incorporated all the canal elements which their sponsors knew to be desirable—and these men were true to the canal's interest—or they did not incorporate all the elements which the men knew to be desirable, and they were not true to the canal's interests. The writer, in this hypothetical case of Commissioners, would choose for them the better part. He believes that all along this technical march each Commission and Commissioner contributed according to his truest light, and that when these two projects went, September 1, 1905, to the international board they expressed the best and highest that the various exponents at that time knew.

It becomes, in the face of this history, surely legitimate to inquire what were the elements, the features, the treatments of the two types as submitted to this body. In short, first, what were the canals as they went into the international board? Second, did the Bates project enter the board incorporating other features and treatments? Third, what were the canals as they came out from the board? The Sphinx at Panama has ever been the Chagres River.

The sea level of September 1 was characterized by certain features for Chagres control. It had a tunnel $3\frac{1}{2}$ miles long. The tunnel of De Lesseps's engineers had at last won out; it was recommended. It had diversions for 20 miles paralleling the canal. Through these diversions it carried the Chagres waters to one ocean alone—the Atlantic. It had for upper Chagres regulation a massive solid dam at Gamboa.

The Lindon Bates project was, in treatment of the river, radically and fundamentally different. First, it divided the river. Second, it used the canal bed itself, always before avoided, instead of tunnels and diversions. Third, it discharged the Chagres to both oceans in controllable proportions. Fourth, it had at Gamboa, for upper regulation, an *undersluice* dam giving normally empty-basin control. On page 29, board report, there is a paragraph which reads as follows:

"At Obispo, where the Chagres cuts the canal line, Mr. Bates introduced a feature which he calls the Obispo triangle, designed to divide the flood waters of the Chagres entering the canal into two equal portions—one to flow through the canal prism toward Panama, and the other toward Colon. The accomplishment of this result is practically an impossibility."

Note, "The accomplishment of this result is practically an impossibility." The vote upon this section of the board's report is unanimous, and the Commission indorses it with the rest. It is further indorsed by the chief engineer.

From the first page to the closing page of this report from board and commission there is not one line, not one word crediting anything to the Bates projects. The Gillette project is adequately recognized and the Bunau-Varilla project is inserted in toto. The brief "Gatun dam" paper (see p. 27) to which the majority and minority give separate and special allusions (see pp. 27-77) was published in toto also. (The Bates feature of terminal lakes is not new.) There was place in the report for every project and brochure submitted, in the

terms elucidated by its author, but place for not a syllable of text from one. The only fair justification—but it would be an ample and final one—for silence and suppression would be that the Bates project and system was not used; that its ideas were not indorsed; that its treatments were not adopted.

We return. The verdict of the officials upon the Bates solution for the Chagres is: "The accomplishment of this result is practically an impossibility." The river is left to its Creator. There is no challenge as to *its* origin. "Mr. Bates introduces the feature." (Board report, p. 29.) The Chagres division near the Obispo triangle, carrying the discharge in two equal parts through the canal itself to two oceans, is conceded to be a Bates proposal and is "impracticable." So, of course, gentlemen, it will not be employed. It will not be found incorporated bodily and openly into any of the three recommended projects. We have the privilege now of examining the sea-level design. The plans submitted to the Board had been, remember, in the possession of two Commissions since the taking over of the canal.

You have the three maps of the submitted sea level, 85 feet, and Comite Technique. Not one, you see, has a divided river. Now, when the sea-level project comes out from the Board *it has no tunnel*. What has become of the \$8,000,000 tunnel? After the triumphant heralding "a place has been found for the tunnel" (see the report of 1904), lo, it has disappeared! What has become of it? Page 45, Board report, middle paragraph, begins, "As to a part of the upper Chagres discharge *will flow to the Pacific*." We are getting upon the track of the vanished tunnel. Having *divided the river*, the tunnel was, of course, not needed, and it was abandoned. No member of the visiting board even went near its site at Panama.

CANAL PRISM.

Is any other feature of this disapproved river regulation adopted? The Bates project alone used the *canal bed* for the discharge. This has been heretofore deprecated. The old sea level incorporated *diversions* overhanging the canal for 20 miles in menace. Is the *canal bed* utilized anywhere? Page 44, Board report, "but the plans for a sea-level canal contemplate a provision which would permit the discharge *through the canal prism*." Indeed! "And regulating sluices near the tidal lock on the *Pacific side*—dividing the flow between the *two oceans*." Canal prism! Pacific side! Two oceans! Yes; we know at last what has become of the tunnel.

DISCHARGE QUANTITIES.

Next, as to discharge quantities: "Designed to divide the flow waters of the Chagres entering the canal into two equal portions."

It will be first remarked that all propositions made are made within the limitations of sanity. Manifestly one does not dip up an onward flowing river to count its drops and set them carefully back. That a spoonful more shall not attain the ultimate Atlantic than the ultimate Pacific he would hardly have ventured to claim. Does fair Portia speak "nor cut thou less nor more, but just a pound of flesh; nay if the scale do turn but in the estimate of a hair thou diest?"

Is the practicability of dividing the Chagres like the Gueber's death bridge, no wider than a sword blade; and is the Panama Canal walking blindfold across it to paradise or perdition? Let us look.

Portia is very exact as to that drop of blood. The halving of the upper river is a very precise matter, and its division if less than that of two absolutely equal portions is "practically an impossibility."

Page 44, Board report, reads:

"Regulating sluices near the tidal lock on the Pacific side of approximately *one-third* of the Gamboa discharge, and to that extent *at least*, mark you, dividing the flow between the two oceans and consequently reducing the current velocity."

One-third at least! One-half along either slope was, in illustration, the Bates division. One-third at least is the majority division. The difference between one-third and one-half is one-sixth. Less than a sixth, may be a seventh, or a seventieth, one can not say which. How large a fraction of this one-sixth was needed to raise the dividing of the Chagres from the "practically impossible" to the perfectly ideal?

And lastly for the denouement. On March 7 the exponent member of the Board testified under oath as follows:

"Senator MORGAN. And some curvatures to pass?

"Mr. BURR. Yes; some curvature; very easy curvature.

"Senator MORGAN. Emphasis seems to be laid by some of the engineers upon the proposition that navigation through that part of the canal would be perilous, or would require very great caution, even under normal conditions of water supply; and that opinion seems to be intensified in respect to the situation that would be created by the incoming of waters from the Pacific or the outgoing of waters from the Pacific in combination with a flood in the Chagres.

"Mr. BURR. The waters from the Chagres floods would only be permitted to enter the canal by these controlling works at such a rate as would not make a current of over a mile and a quarter an hour at most.

"Senator MORGAN. But that current might go either way.

"Mr. BURR. If the current goes both ways, if it were equally divided and should go both ways, it would only be half that.

"Senator MORGAN. Yes.

"Mr. BURR. So that even if it all goes one way, even if it went toward the Pacific, which is scarcely conceivable, there would be no current—experience shows that—which would be materially inconvenient to navigation.

"Senator MORGAN. You say experience shows it. I suppose you have some model or plan which looks exactly like this?

"Mr. BURR. No; we have more conclusive evidence than would be shown by a model. We have the evidence of the navigation of the Suez Canal, where the curvature is not so very different from that which would exist in the sea-level canal, and with a much narrower prism."

Half or even all of the upper Chagres through the canal to the Pacific.

The stone which the builders rejected the same is become in very truth the head of the corner of the sea level.

TERMINAL LOCK SITES.

Are there any further features of change in Commission projects bringing them into identity with those of the writer? When the sea level and old 85 feet entered the Board, the Pacific terminal lock sites were for both, at Miraflores.

The Bates project set its end lock at Sosa-Ancon. As early as 1859 was laid down the supreme law for Panama—"end locks should be the closest possible to the coast." Miraflores was the site heretofore supposed the outermost available for a terminal Pacific lock. The writer saw differently, and maintained that the correct place was Sosa-Ancon. He claimed to have sufficient data to assert that rock foundations existed here, and hence that his contention was incontrovertible. The command of the President had been that all data necessary for judging projects be gotten for the Board. Wishing to be beyond challenge he formally requested that contours and borings be gotten on the sites of his two terminal locks—Ancon-Sosa and Mindi. His project was submitted by the Commission to the Board September 1, with this observation (page 11): "To obtain this (the Bates data) extensive additional surveys to occupy at least a year's time would be necessary."

Page 25 states from the Board:

"It early became apparent that additional information was desirable relating particularly to the possible dam and lock sites at Mindi-Gatun and in the vicinity of La Boca. The Board requested the Isthmian Canal Commission to have further examinations made as follows: * * *

Page 26 continues:

"Borings were taken across the valley along the lines indicated and this information was forwarded for consideration to the Board. The borings in the vicinity of Sosa-Ancon Hill, as well as those in the marine section, were given on Pl. VII. They show the practicability of a lock in the Ancon-Sosa saddle and also at the westerly foot of Sosa Hill."

The explorations, therefore, which were to have consumed a year when the Bates project was concerned, were forthcoming, while the Board still sat, when they unanimously decided to shift their end lock sites.

The writer's contentions regarding the Sosa-Ancon lock site being vindicated, the complete Board, both majority and minority, and Commission transferred themselves to his designated location. On its foundation (thus sustained) the majority set its one tide lock and the others their tier of two locks.

Next, what befell at Mindi, his Atlantic terminal lock site? The axiom, "end locks the closest possible to the sea," should, winning out thus openly at Ancon-Sosa, have won out also at Mindi. Why did it not?

The favorable report of Mr. Maltby, the engineer designated to get the data for Mindi, is given on page 26. Yet no borings whatever on the dam sites were ordered. The callous indifference to an interest weighty and pregnant, as shall later be shown, for the whole future of the canal as this Atlantic terminal lock site is inconceivable. Mr. Maltby writes in his official letter: "This (Jamarillo) is the first hill on the right that we saw when we went down the Chagres River."

The international body apparently never put a foot on shore to examine the location. They passed by this and more hills in the launch, and their own engineer feels obliged to identify to them the district—Jamarillo Hill—"on the right that we saw." Little things have decided the destinies of momentous things at Panama. Again, as at Sosa-Ancon, the writer's every claim and contention are more than vindicated. But the French borings and cuttings and those made otherwise give rock foundations such that the availability of the Mindi site is made incontestable.

DIMENSIONS.

But we continue the comparison of the before and after of the International Board. The sea-level project, submitted September 1, gave for the canal bottom, at Culebra, a width of 150 feet and for canal depth of 35 feet. The Bates project gave a minimum average bottom width in rock of 200 feet and a depth of 40 feet. In his presentation he inserted a table of ship's growths and a diagram of a 35-foot canal with an existing Cunarder inserted. The vessel was seen to project beyond the bottom nearly 2 feet. This was an object lesson at least. As recently as seven months before this Board met the sea-level committee and the chief engineer had reported their latest design and estimate. It gave a 35-foot depth, and based upon this its entire design and estimate for the canal \$230,500,000.

How do the sea-level dimensions come from the Board?

Page 57:

"In rock the bottom width was taken at 200 feet," etc.

Page 56:

"The depth of 40 feet was therefore adopted by the Board as the standard minimum depth in the canal."

GAMBOA DAM.

A much disputed problem was, of course, the upper Chagres regulation. How did the sea-level proposal of September 1 achieve this? It had a high lake impounded by a huge *solid* dam at Gamboa. Its lake was therefore incapable of being emptied save in its upper third, and then by means of a tunnel. In this full lake the Chagres floods were to be caught and held.

The Bates design opposed such a system of treatment. It set at Gamboa a low dam with *sluices*. Through these sluices the water, during normal discharges, was to be run off, thus keeping the water lowered to the lowest plane which the conditions admitted. In this basin of the lowest possible level (and normally it would have been empty, except for the silt trap) the excess floods were to be caught and imprisoned till the subsidence of the flood situation admitted of their gradual discharge. This constituted the last feature enumerated for his Chagres solution—the normally empty basin control. The sea-level *solid* dam did not, you remember, discharge their lake. This was its September 1 solution. What solution came out of the Board?

The sea-level type of dam for Gamboa is given on page 44 of the majority report. We read:

"So that if 15,000 feet of flood water per second from the Chagres be permitted to *enter the canal prism at Gamboa*," etc.

A solid earth dam? No; an under-sluice masonry dam. And again:

"The plans for a sea-level canal contemplate a provision which would permit the discharge through the canal prism and regulating sluices near the tidal lock on the Pacific side of approximately *one-third of this Gamboa discharge*, and to that extent at least dividing the flow between the two oceans, and consequently reducing the current velocity. * * * The Board has therefore assumed that the *controlling sluices to be provided in the Gamboa dam* may admit the flood waters of the Chagres to the canal prism at the uniform maximum rate of 15,000 cubic feet per second."

And again:

"A uniform outflow from the lake at the rate of 15,000 cubic feet per second would discharge the entire maximum average forty-eight-hour flow of the 1879 flood in eight and seven-tenths days. It is seen, therefore, that there would be no practical difficulty in *depressing the surface of the waters in Gamboa Lake* between two severe floods sufficiently to receive the entire maximum average forty-eight-hour flow of such a phenomenal flood as that of 1879."

Depressing the surface of the waters!

So the last feature of the Bates conception is taken with the rest. The whole upper Chagres, carried through an under-sluice dam at Gamboa as the writer proposed, divided near Obispo and reduced to harmless currents, and then borne in the canal bed itself to the two distant oceans—this is the solution of floods which comes out of the International Board as the "*majority design*" for the Panama Canal.

SITES OF OTHER DAMS.

Are there any further resemblances? Are there changes in other features of either Commission project? The 85 feet went to the Board with a huge dam under 85 feet of head at Bohio.

The Bates presentation claimed that this position limited the lock supply and was for a massive high masonry-core dam unfeasible on the revelation of borings (p. 13, Bates report). Yet the Commission projects, though two years under American study, brought in no recommendations except for abandoning Bohio and adopting a sea-level and tunnel scheme. Their 85-foot plan incorporated the same massive dam as heretofore and their project went to the Board with this same feature.

The Bates project, condemning Bohio, set a dam at Gatun instead, a small dam under a 29-foot net head.

The Bates design set also a dam at La Boca and a barrage from Ancon Hill to Sosa. Neither official project had any such feature. When the Board has reported we read for the minority (p. 77):

"The principal dam is the one at La Boca, which extends from the locks at Sosa Hill, across the mouth of the Rio Grande, to San Juan Hill. The other dam extends from Sosa Hill to Ancon Hill and from Ancon Hill in the direction of Corozal to high lands just across the Panama Railroad."

A last comparison.

SALT OR FRESH WATER HARBOR.

One of the fundamental features of the writer's design was a combination of salt and fresh water harbors at the termini. He

pointed out at length the great superiority of such an arrangement in facility and safety and healthfulness for commerce.

Neither Commission design, as submitted September 1, had combined harbors. How do they emerge from the Board? The maps are before you. You will find on the Pacific the minority in possession of the combined fresh and salt water harbors, but separated by two locks.

NEXT AS TO TERMINAL LAKES.

A remark let drop recently intimated that there was a surprise in store on terminal lakes. The card is now played—"The Bates feature of terminal lakes is not new." (See pp. 27 and 77, Board report.) The speaker owns frankly that he did not know in February (1905) that in 1880, at a meeting held in New York, when he lived in Oregon, a paper of nearly two pages and a half (republished in 1904) was read upon "A Gatun dam." The pains with which both parties, separately, and the full Board at the very opening of its remarks, announces the existence of this paper, brings the deliberations of the International Board convened for the purpose of discovering the best type of canal for Panama dangerously close to the humorous. Both parties, majority and minority, have adopted terminal lakes for the best lock plans. The Bates project alone of those submitted to the Board incorporated terminal lakes. The feature is nowhere credited to Mr. Bates; instead there is this careful assignment of it to two sources—one of 1879, one of 1880.

The majority does not state the 1879 source of the Board's inspiration. The minority, however, does. On page 77 the author who first gave them their concept is announced—Mr. Kleitz of 1879: "The idea of building dams and forming lakes at or near the ends of the canal is not new. As it was suggested by Mr. Kleitz at the International Congress of Engineers at Paris in 1879."

The writer laid down the preamble that the long succession of committees and Commissions in charge of the Panama Canal were to be held intelligent, informed, and conscientious. That if at any stage of development ideas were advanced and were by the type's own advocates declined, it was rational and alone honorable to infer that the idea was rejected because, according to the Commissions' best light, it was not as then submitted desirable for the canals as at that date evolved. If, then, no official project entered the International Board with terminal lakes, the only fair inference is that the two Commissions which had held under continued examination since the canal came into American possession, their sea-level and high-lock designs had either not known of the terminal lake conception or had not up to that date deemed terminal lakes desirable.

Now both majority and minority accept end lakes, and both put forth to cover the incorporation Mr. Kleitz of 1879 and the Gatun dam paper of 1880. The Commission had the Bates brochure six months, lacking five days, when it was sent to the International Board. The Commission submitted it for examination, with this introduction (p. 11):

"The Bates project, which is interesting on account of its novelty, and is therefore laid before you."

The Bates presentation had been studied, for the Commission adds that "It does not give detail enough for a close analysis" (p. 11). The final presentation supplied this fully, however.

Now, no one will precede the writer in maintaining proprietorship of ideas. Ideas lie in that intangible realm where legal claim is evasive, and where, therefore, moral claim is tenfold binding. He commends fully the desire of the Board to pay tribute to the mind that inspired them with the conception of end lakes. Their combined acceptance proves this feature to have been extremely *valuable* for the canal. Neither of the Commissions advanced the proposal before. Both *take* it now. They are right to go back to that far day of 1879 and give credit to the man who supplied them with it. The writer goes back with them to lend his presence to this befitting, even though 25-year-old homage to Mr. Kleitz of 1879.

The official report of the 1879 Paris congress includes all the technical subcommittee reports. It is a bit awkward, is it not, that Mr. Kleitz, here at last crowned, did not submit an idea for a terminal lake—that Mr. Kleitz did not have in his project a terminal lake? Pages 384 to 389, inclusive, of the official report of the Paris congress gives the Kleitz contribution. It reads (the note of M. Kleitz): "Possibilities of a lockless river for the Panama Canal."

Kleitz was a well-known mathematician. His four-page presentation gives a series of calculations upon Chagres discharge. It concludes that to construct a lockless waterway would necessitate "turning from the canal itself all the waters of this river."

Since the publication of this report compelled the writer's inspection of these very early and long-buried records of the declined, in Panama engineering history, he has dug up the story of the terminal-lake conception. For his own sake, in defense of truth and history, he wishes therefore to take this idea back and give credit to the first man who did conceive it. He needs to snatch no wreaths from graves to save his project. Instead, he goes back to 1859 and lays this belated homage at the feet of that clear-seeing engineer, Godin de Lepinay. He writes:

"I thought of it in 1859, when I was designated by the minister to go to Darien. I believe I spoke to Mr. Blanchet regarding the incorporation of this idea into his Nicaragua Canal."

De Lepinay's injunction shows the master insight. He writes:

"The barrages shall be placed as close to the sea as the configuration of the land admits, *perhaps at Gatun*; if not, then certainly at Bohio-Soldado."

De Lepinay's report was not published by the congress. The only clue remaining by which to trace the history lies in these two remarks made in a subcommittee meeting.

But the Congress relegated his conception to defeat. Some way and somehow, for the lock canals as then designed, his idea did not fit, according to the judgment of the world-famed engineers sitting there on the types.

The *final vote* in the general congress of Mr. Kleitz and the announced *abstention* of M. de Lepinay make striking history. The first voted for the sea level. The latter announced his strong opposition to the sea level in these words:

"All my conscience is intensely enlisted. I am the only French engineer a member of this congress who has executed works in that

country there. If I have not known how to make my advice triumph, I can not let it be believed that I abandon it, all unknown though I am. I shall have gone out of this assembly, as others have done, that I may not leave my name subscribed to a measure disastrous.

"Finally, and this is the greatest with me—me who has executed works in that tropical America: Reducing these insanitary works to their minimum (the lock type) spares the life of more than 50,000 men uselessly sacrificed for the execution of a sea-level project. To not charge my conscience with these unnecessary deaths and the loss of a considerable capital, I abstain, or I vote 'No.'"

Two men in the subcommittee, however, seemed to have been impressed and to have believed that better study might have wrung grace out of this conception. These two men were American. The book of these delegates, of whom Menocal was one, speaks in a place, the writer discovers, of de Lepinay's proposal for a *Gatun dam*. This book reads:

"Entered by act of Congress in 1879." It was published in Philadelphia. De Lepinay's idea, therefore, comes straight in descent to Philadelphia and in the year 1879. The small New York meeting was discussing Panama. The 1880 leaflet begins (Appendix I): "In a paper entitled 'Interoceanic Canal Projects, by A. G. Menocal.'" The writer was studying Menocal. What becomes of Gatun dam paternity in 1880?

But it matters not one hair's weight to anything save history. The true goal is the present, the best project here and now for the Panama Canal. The writer was not concerned with the Commissions' designs. He was not seeking to reform an old order; he was establishing a new order, radically different and antagonistic to what had gone before. He outlined his claims, and he did it unmistakably on page 17 of his presentation. It reads:

"These three factors, then, the terminal lakes, empty basin and divided control of the Chagres, and terminal harbors of original and strategic dispositions, go to make up a fundamentally new system upon which may be fashioned the concrete plans for the American canal. It is manifest that such a combination of engineering mechanisms can not be narrowly conceived as bounded by one or two detailed schemes with metes and bounds of location and dimension. Under the new system there are possible several plans. The terminal lakes can be made at a higher or lower level and the discharge at this or that alternative location; the empty basin sluice control can be effected by one or two or three dams at various heights and sites. The terminal harbors may be changed as to breakwater, form, alignment, or other details. But the principles and the systems remain unaltered as a new conception and proposal."

"The author has, it is true, specified and developed definitely from all the data available what he holds to be the best plan under his system. But these are only parts of a greater whole. It is not project A or B or any modification that go to make up the claim to a new canal. It is the inclusive system of lakes, Chagres control, and terminal harbors whose principles are fundamentally original."

What are the elements of the Panama Canal? Dam sites and water sites, dams of different types and heights, varying levels, treatments of rivers—such and such only. An engineer does not create elements; he can but combine. The writer had only the same elements as were

possessed by every man since 1859. These had been through half a century shuffled and reshuffled, combined and recombined. If at last in the year 1905 he, shuffling still another time, combines differently, treats antagonistically, and applies the world-old principles in a new method, has he done nothing?

Howe did not create the thread, nor the needle, nor the iron, nor the bands, yet no one disputes him the inventor of the sewing machine. The right to new combinations is the basis of the whole world system of patents. And in the Patent Office there is an antipodes of difference, a great gulf fixed, between combinations which *will* work and combinations which will *not*. The first man who makes a *workable* tool is its creator, no matter how many myriads may have had its elements before. So the discovery of a terminal-lake conception, dating back to 1859, matters not one breath in this discussion.

It is seen, therefore, that every primary element and treatment of the Bates canal, from its Atlantic lock to its Pacific lock, and including its complete Chagres River solution, is found accepted and adopted by one or other of these three Board projects. His canal is therefore much better accredited than any other, for the old designs differ radically and fundamentally from each other.

SIMILARITY BETWEEN BATES PROJECT B AND THE 60-FOOT DESIGN
RECOMMENDED BY THE MAJORITY AS THE BEST LOCK CANAL FOR
PANAMA.

A few facts must be remembered. First, the *exact* best level for the summit stretch of any canal of lock type should not be decided finally and inexorably at the Isthmus until more complete and exact surveys have been made. One of the vital determining factors must always be the quantity and quality of Culebra cut. Through this massive rock barrier it is desirable to demand the least excavation advisable in a four-lock canal. The difference of an inch or two, even of a foot or two, in level is not fateful one way or the other or inherently momentous, while it may mean a very material difference in what is to be gotten out, and hence to the cost of the canal. It is not wise, therefore, to narrow to the inch here on the threshold the level and set up a fixed and immovable prohibitive against the small adjustment, which may be found to mean a great difference in expense. While, therefore, the writer set his summit level of B at 62.5, he noted the need for this small margin of elasticity, and stated that the level should be no more arbitrarily fixed than that the canal's summit level should be about +62.5.

A second determining element was the height accepted for lock lifts. His projects allowed its willingness to consider as safe locks of up to 36 feet lift. Certain limits, therefore, like these were established on certain features determining important issues, but a definite selection and preference was, notwithstanding, announced for each item. Second, awaiting the final contours and borings at Sosa-Ancon and Mindi, he selected alternative sites. On the Atlantic he gave Gatun as his second or alternative location, always announcing, however, that Mindi was first. But the final and controlling borings had (as was said) not yet been reported.

Far be it from the writer to claim any monopoly of ideas for

Panama. He has but his small pint cup dipping into the vast, infinite ocean of thought. Many men, many minds.

The International Board was obligated to draw out new ideas. These ideas were almost equally bound to lead to the betterment of the two canal types. He is neither so blind nor so foolish as to fancy that some of these alterations, like the change of dimensions, would not have come, probably here and now, if he had never lived. All he does say is that he has proved a passing good prophet in his own country for what the future was destined to hold, and that he anticipated and provided much that this International Board was fated to want.

Lindon W. Bates's project B—Recommended majority lock project, 60 feet.

[Board report, p. 35, project IV.]

	Board lock +60 feet.	Project B.
First lock.....	Gatun	(First choice) Brochure 1, page Pl. IV, Mindi or Gatun.
Lift first lock	30 feet	27 to 33.5 feet.
First dam	Gatun	Mindi first choice, Gatun second choice.
Second lock	Bohio	Gatun first choice, Bohio second choice.
Second dam	do	Do.
Head first dam	30 feet mean	27 to 33.5 feet.
Head second dam	do	29 to 31 feet net.
Type first dam	Undersluice and earth	Undersluice and earth.
Type second dam	do	Do.
Gumboa dam	180-foot crest	Crest at +118.8.
Gumboa dam type	Undersluice	Undersluice.
Third lock	Pedro Miguel	Pedro Miguel.
Summit level	60 feet	62.5 feet.
Fourth lock	Sosa (west side, but east preferred).	Sosa (east or west side; east preferred).
Spillway and lock	Separated	Together preferred; separate admitted.
La Boca dam	Same	Same.
Sosa lock	26 to 35.5 feet lift	26 to 35.5 feet lift.
Panama Lake	26.5 feet	26.5 feet.
Alignment	Identical (Mindi to islands)	Identical (Mindi to islands, variant B.).
Usable length locks	1,000 feet	1,000 feet.
Depth	40 feet	40 feet.

OBISPO BASIN.

The elevation of the bed of the Chagres opposite Bas Obispo is about +45. In all the canal projects before the Congress the drainage discharge of the upper Chagres meets here the canal channel at right angles. The water, therefore, must by force of the natural conformation *itself* divide. Local conditions, of course, determine the exact parting of the water, which will vary within limits and can be varied as to relative amounts going each way by manipulation of the sluices at each end of the summit level. The +85 lake waters divide and flow both ways from this natural triangle. Part go north, because there are escape sluices in the Gatun dam; part go south, because there are locks and sluices at Pedro Miguel and because the +55 lake of the minority must be filled and fed against the losses of percolation, infiltration, evaporation, and gate leakage.

The decision in favor of two outlets through the navigated waterway—a treatment found in neither project when it entered the Board, but adopted by both majority and minority *now*, compels a dividing of the Chagres in the so-called Obispo basin. All projects before the Senate committee—sea-level, minority, majority, 60-foot, and Bates—all have a body of water which *divides itself* at or near

the Obispo basin. Not precisely "automatically," but as the result of mechanical manipulation. This the writer has advocated.

The same is avowedly true of the sea-level plan. After condemning and repudiating this principle, both the majority and minority make it an integral and vital factor of their deliverances.

Into what, for a name, was termed by the writer "the Obispo triangle," the sea-level allows 15,000 cubic foot-seconds to emerge from the Gamboa sluices and sends, as they state, *one-third* out of the sluices at Corozal and *two-thirds* to the Atlantic. Such careful fractions!

The cutting of the canal makes a *delta* for the Chagres with two mouths, and a delta is a triangle in the Greek alphabet. In order that the upper Chagres water and the currents—whether emerging from Gamboa sluices or from an arm of the +85 or +62.5 lake—shall not interfere with traffic passing at right angles, certain work is necessary. The borders of the basin should be trimmed to the best shape and the basin should be made deep and large enough to absorb the currents and create a turning basin.

Navigable depth is wanted.

The sea level has here the most to do. It must excavate some 85 feet and shape the basin to the semblance of a triangle. As the summit level is raised the amount of work needed diminishes and the natural borders of the triangular basin enlarge.

The +85 plan has a little less to do here than project B at +62.5. All plans should so arrange that a 1,000-foot ship shall be enabled to turn around. Project B requires but 300,000 cubic yards of excavation here.

+85 LAKE.

The monstrous dam and staircase of locks at Gatun—too small for commerce and too big for their site—make a high navigable lake. This lake is so high that it makes a continuous railway all but impracticable. But of this anon. The lake leads to a 45-foot minimum channel through the sunken valleys and the central mass. Such a depth is good. It is better than the old 35 feet of the Walker Commission, but it is not *yet* what is necessary. The minority gives over gate sills but 40 feet of water. To change this must stop trade some day, or they must build new and larger and deeper locks. But there is no room for larger and deeper locks at Gatun.

It seemed to the writer better to design his gates and structures so that in the future—after the dams and locks have stood the tests of time—the lake levels might be raised 1, 2, 3, 4, or 5 feet, keeping pace with the demands of commerce. It is certainly cheaper to deepen by regulating the lake discharge sluices than to dig rock for 8 or 10 miles, 5 unnecessary feet through the Culebra, with all this means of bottom and slope excavation.

The minority do not wish to raise their lake head to 90 feet, evidently. Thus it comes that in reality the bottom of the central summit level of B is but 17.5 feet lower than that of the minority.

The elaborate summary of "navigable widths" is misleading. What a vessel wants for good steering is top width to the channel section, and buoying in a submerged lake channel does not limit speed, as averred. Vessels can pass each other as well in the +62.5 lake as in the +85 lake. The side hills are nearly everywhere steep, and the two

contours where they are important to the channel are little apart horizontally.

The +85 lake is announced to be a better receptacle for floods, so really floods are not regulated by any sluice dam in entering their lake. Those into his lake are controlled by the Gamboa, Cano, and Alhajuela dams of project B.

The flow line of the +62.5 includes the mouths of the Palenque and Chilibre rivers beyond Gamboa, and the +85 goes only a little farther. Which is the safer flood regulation, this or to have two normally empty basins above the flow line, dividing the entering rush in two parts and setting the areas of disturbance some miles farther from the navigated channel?

Project B has *both lake and double under-sluice* regulation, while the +85 has *only lake* regulation. Which has the larger factor of safety against such a flood as that of 1879? Does a margin of narrow waterway averaging but 11 feet deep, such as exists between the flow lines of the +62.5 and +85, give more security than under-sluice dams and their reservoirs ready for instant service above Gamboa and Alhajuela?

The writer fails utterly to see where and how this indefinitely controlled upper Chagres flood regulation is worth the offset of two locks and all that they mean to vessels, together with an unparalleled dam and all the attendant elements of cost, delay, difficulty, and perpetually increased risks.

DISTRIBUTION OF CULEBRA MATERIAL—END DAMS AND LAKE.

There remains to be excavated under the minority plan 53,800,000 cubic yards from the Culebra section. But nowhere in their report do they say what they propose to do with it. The chief engineer testifies that it would be a good thing to mix it with the mud batter and put it in the Gatun dam, but he tells not how much. He would also put some "below Bohio." (See testimony before Senate committee.) It is understood that he proposes to haul half each way somewhere from the center of the great cut. So we must assume, in tracing vaguely what is intended that about 27,000,000 cubic yards go toward the Pacific. Apparently (p. 245) there go to—

	Cubic yards.
Back filling and embankment, Pedro Miguel.....	390, 000
Dam, Pedro Miguel.....	1, 100, 000.

which, however, is offset by the excavation from mile 39.60 to 41.47, totaling 1,460,000 cubic yards.

They likewise seem to have—

	Cubic yards.
Mile 41.67 to 45.08.....	220, 000
Excess from Sosa lock.....	480, 000
Outside the lock.....	5, 330, 000
Total	6, 030, 000

The Ancon-Sosa, Ancon-Corozal, and La Boca dams require 12,280,000 cubic yards. It is unlikely that over 1,280,000 cubic yards from the above 6,030,000 cubic yards would go into the dams from the dredges. This leaves to go into the Panama dams from Culebra 11,000,000 cubic yards, and 16,000,000 cubic yards to go somewhere outside of "Lake Sosa." Possibly some 6,000,000 may go into the

space east of the Ancon-Corozal dam, providing the drainage of the Juan Diaz and Puente creeks is properly cared for—something which the minority overlooked. A considerable area is drained by these creeks, but no provision is apparently made for their run-off. There remains 10,000,000 cubic yards to go where? To sea by barges. This would be a waste of opportunity to make breakwaters to the islands or reclamations, serving a useful, valuable, or military purpose.

We have heard much of the French transporting Culebra spoil uphill, but it is not recalled that they ever were guilty of proposing to haul 11,000,000 cubic yards downhill and then hoist it into huge high-head dams overhanging Panama or of bringing 20,000,000 cubic yards to Gatun.

PANAMA AND BALBOA DAMS.

If the Ancon-Corozal dam, with 55 feet of water behind it, should get an earthquake crack, the survivors of the city, if there were any, might return to the "ruins of old Panama." There would be nothing left of new Panama.

It and the La Boca and Sosa dams total 12,150 feet long—over 2 miles. In project B there is one rock-and-earth-fill dam of one-third this length and one-half the head and height. It contains no menace to the city. Project B requires no Ancon-Corozal dam, because a trifling embankment a few feet high eastward from Santa Cruz on the railway, at the foot of Ancon Hill, defines the Lake Panama of project B and solves the drainage of the creeks, lately mentioned, without expense.

There is a vast difference between the cost and hazard attaching to the minority's end lake "Sosa" and the one the writer baptized in this valley as Lake Panama.

It is rather of interest to note that when the writer's brochure was published a year ago there were no foundations for end locks and dams but "mud," and no one in authority knew this site from 1879 till then. Now the condemned locations are reluctantly bored, and lo! rock is nearer to the surface than at any dam site on the canal, except at Alhajuela. It will be the same story at Mindi. There are nine separate hard hillocks in the axis of this Mindi dam over 40 feet high. The bases of these knobs are only 200 or 300 feet apart.

Lake Sosa indeed saves a little rock and mud dredging, but it introduces a number of serious and expensive difficulties of execution. Lake Panama, half as high, is a simple affair by comparison. The writer conceives that no useful purpose to navigation is served by the higher lake, which likewise imposes an entire relocation of the railway below Pedro Miguel. The lower lake merely requires the small amount of grade raising shown on the plate of Colonel Totten's map, about the only thing showing the character of the topography east of Panama in the Washington office of the Commission.

DISTRIBUTION OF SEA-LEVEL SPOIL, CULEBRA.

Nowhere in their report that one can discover have the majority said what they are going to do with Culebra or other excavations. One sees much of steam shovels and a reference to "transport being the principal isthmian problem." Quotations from Board report:

Page 60—

"The Board recognizes that the removal of the material in the summit cut is in reality a problem of transportation. It is a comparatively simple matter to excavate the material within a much shorter time than that allowed for the work, even on the supposition that all of it except the clay near the surface must be shattered by preliminary blasting. The whole difficulty attending this part of the construction of the canal is attached to the removal of the material from the shovels or other excavators to the spoil banks. This problem of transportation is in reality the substance of the problem of building the transisthmian canal, and in treating this part of the project the Board realizes and has considered the large amount of railroad track and the extensive transportation organization required for the disposition of the waste material. It is probable, as has been estimated, that not less than 3 miles of standard track will be required for each shovel employed, making a total of 300 miles of trackage for 100 shovels.

"It is assumed that 100 shovels are available for continuous work, there being a sufficient surplus above that number undergoing repairs whenever necessary to maintain the working complement, it can be demonstrated that as much as 20,000,000 cubic yards of material classed as rock may be annually removed from the summit cut."

Page 60:

"The time required to remove this great mass of material, by far the greater part being soft and hard rock, will depend greatly upon the efficiency of the method of operation and the organization of force and plant, all of which must be ultimately the result of most careful consideration of all the elements, including those of climate and character of labor available."

Page 61:

"It is found that the entire quantity of 110,000,000 cubic yards of material in the divide can be removed within ten years. (For time curve, illustrating practicable excavation of Culebra cut, see Pl. XXXI.)"

Where does it go? They demur to the Panama breakwaters or to an "ambitious" reclamation of the Panama tide lands, making a useful property, even if "many times in extent the area occupied by the present city itself." For which latter reason they condemn it. The Rio Grande Valley is preempted for adjacent excavations and the care of its watershed, whence 6,000 cubic foot-seconds must sometimes run off.

So it must be that it is to be taken in barges to sea—what a waste! And what a travesty that the principal problem of the Isthmus—"transport"—remains as to estimation so far as they enlighten us (they or the ex-chief engineer either in his appendixes) still a riddle and a mystery.

CULEBRA SECTIONS—TYPICAL SECTIONS.

The typical sections adopted for the Culebra cut are shown on the plates which accompany this review. Those taken by the writer are in substantial agreement as to slopes and terrace widths with those evolved by the French engineers and the Commission of 1901, except that the waterway is enlarged to a minimum of 8,000 square feet. The surface width is 210 feet and is preferred to the Board's

208 feet. The bottom width is 190 feet to the Board's 200 feet, but he has planned a gradually enlarged section of Pedro Miguel to take care of surface drainage from the terraces. The minimum ruling section below the water surface is practically the same. Practically all plans must yield and be adapted to the conditions found when the excavations uncover the formation now out of sight and definite knowledge.

Above water the Board and minority make a wider berm than the writer and diminish the width of the terrace above to the rock line, and they plan higher terrace steps. In such broken and varied formation and having regard to the *sudden* character of the tropic downpours, the writer believes it ill advised to thus diminish the terrace widths and the number of longitudinal drainage ditches. Above the "rock line" the Board make a long flat slope, which naturally concentrates all that falls on the "earth" slope on the upper terrace, whose width the minority, under such conditions, advisedly makes 50 feet.

But it seems to the writer that the terrace system should not stop at the "rock line," a most ill-defined and variable thing. It should extend nearly to the top of the cutting, the risers lower and treads of the steps wider, and the average earth slopes one to one and a half.

CULEBRA ESTIMATES.

The quantities appearing in the writer's presentation have been questioned. This contingency was foreseen and allowed for by the writer, because he did not have and could not get the detailed cross sections and station estimates. This he covered in a contingent item of \$10,000,000 to meet extra excavation or bank protection which circumstances might develop (vide p. 263). This sum, for illustration, will excavate 16,666,666 cubic yards, at 60 cents per cubic yard—a figure ample because the plant is amortized against the main quantities. He does not subscribe to taking the unit prices of the Board (based at Culebra upon steam-shovel method alone), as stated on page 29. He knew then, as he knows now, that American contractors and men accustomed to devising and applying methods to new conditions had never been given a particle of opportunity to apply their talents to the Culebra problem of excavation and distribution. Besides this, he specifically stated that he attached some value to the money expended to September 1, 1905, in the following terms (p. 263, Board report):

"NOTE II.—It must be borne in mind that during the past eighteen months large sums have been expended on the Isthmus, and the value of this work reduces the unit prices of Item IV."

The shovel commitment was taken out of hand and without due consideration by men inexperienced in canal work or in the Tropics. The steam shovel is a temperate-zone tool and ill adapted to working efficiently during three-quarters of the year because of rain. To pit the 20-year-old French excavateurs against modern steam shovels is ridiculous. The fact should be here registered that where the ground suits the modern excavateur it is far ahead of its ancient prototype, and is a better tropic tool, because it is more automatic and depends for efficiency far less upon the human equation. It leaves its terrace in a smooth, not in the broken condition charac-

teristic of steam-shovel work; but the progress of this implement was never fairly investigated. There are also inherent possibilities of rapid and cheap work during the rainy season in the cantilever crane and cableway equipped with proper grab buckets which should not be ignored, and they have been.

DEPTH OF PANAMA APPROACH.

We make the following quotations from the Board report:

Page 50:

"Beyond this tidal lock there is to be a straight channel projected into Panama Bay, with a bottom width of 300 feet and extending for a distance of $3\frac{1}{4}$ miles to the 45-foot contour." (Contours refer to mean sea level.)

Page 55:

"The bottom width of the entrance channel leading from deep water off the island of Flamenco to the tidal lock near Sosa Hill will be 300 feet, but the side slopes will depend upon the character of the material to be excavated. Inasmuch as extreme low water of spring tides will occur but rarely, the depth of excavation in this dredged channel is recommended to be but 45 feet below mean sea level. This excavation is sufficient to give at least 40 feet at low water for all but those spring tides having a range of more than 10 feet. As the mean tidal range in Panama Bay does not exceed about 14 feet, it is considered that the depth of excavated channel to be provided will never be a source of any inconvenience or any delay whatever for the great bulk of the traffic of the canal, the measure of the maximum inconvenience for ships of greatest draft seeking the canal, if they should be ready to enter it at extreme low water or at about that time, being a total of only two or three hours."

By examining the Official Tide Tables for 1906 one finds that 330 times in a year ($27\frac{1}{2}$ times per month) there will be *less than 37 feet* in this channel below mean sea level. The time when there will be but between 35 and 37 feet totals seven days. And there is a much longer total time when the depth is less than 40 feet, the standard, provided at Colon every day and hour in the year, according to both plans of the Board. The writer submits that the Board's conclusions are not well balanced in respect to this abridgement of the depth and width of the Pacific harbor facilities of the canal.

On chart No. 1042 are shown the contours of Panama Bay from mean sea level outside of the islands. This appears to show, further, that the approach shoals beyond their terminus and that the 45-foot contour below mean sea level is *a mile farther out*. This chart was not before the Board, who used chart No. 1950, which does not contain soundings far enough beyond the islands to disclose this condition on the canal axis.

Furthermore, 3,500 feet beyond their terminus, the sailing line, prolonged, passes over a rocky reef carrying but *30 feet* at mean low tide. It is some 750 feet across on the minority line. This sunken reef runs three-quarters of a mile in a direction 20 degrees north of east from the visible rocks called San Jose. The chart shows it to extend for *900 feet* directly athwart the entrance line. On the sea-level alignment the reef is over a mile wide and still shoaler.

Now, this reef is where there is positive wave motion enough to affect a large and deeply laden steamer. Hence for practical purposes of navigation it may be said to carry for the minority not more than 25 feet at mean low tide or 33 feet at mean sea level and less for the majority. The writer adheres to the view that this axial line is wrongly placed from the standpoint of the ship's draft, which, by law of Congress, must be observed. He still prefers the new alignment and harbor dispositions he advanced.

RELOCATION OF PANAMA RAILWAY +85 SCHEME.

We quote page 94 of the Board report:

"Between Mindi and Gatun recent surveys show that the work will not be particularly heavy or expensive. Between Gatun and Bohio no recent or complete surveys are available, but the information at hand is sufficient to show that a reasonably direct line crossing the lake and taking advantage of the support afforded by the highlands along the route is preferable to one going around the lake. There will be some heavy work along this line at the crossing of the Gatun and other valleys, the maximum height of embankment being about 80 feet, which is not unusual in railroad construction.

"From Pedro Miguel toward Panama the railroad may be located without special difficulty around the margin of Sosa Lake until the northerly end of the Ancon-Corozal dam is reached, and it can then run along this dam, which furnishes a direct route to Panama.

"For the 10 miles of relocation required between Mindi and Bohio, \$2,000,000 have been included in the estimate, and for the 6 miles between Pedro Miguel and Panama \$400,000 have been so included. The estimate of the Isthmian Canal Commission of 1899-1901 for 24.5 miles from Bohio to Pedro Miguel is, in round numbers, \$1,300,000, making the total estimated cost of the relocation of the railroad \$3,700,000."

This is a serious report. Let us examine this "80-foot embankment."

The Maltby survey is only from Colon to the Gatun ridge, a distance of 16,000 feet—3 miles. If the grade across Gatun Lake is put high enough to guard against the risks of subsidence and compression of the swamp muck, it is pretty safe to say that the embankment from the Gatun ridge to Tiger Hill will measure from top to bottom (including 10 per cent only for sinking of the swamp material) not 80 feet, but at least 90 feet in height. Doubtless it will be allowed a top width of 24 feet, and since it is across a lake the side slopes will be 3 to 1 and thoroughly riprapped on both sides, or built of rock spoil like the exposed front of the monster dam. Then we have a section which runs about 1,000 cubic yards per foot.

From the only surveys extant it appears that this embankment may total from 7,000 to 10,000 feet long, and must contain 7,000,000 to 10,000,000 cubic yards. And besides there are other great cuts and fills and bridges. One can not but think that the \$2,000,000 estimate for the "10 miles" to Bohio will be largely exceeded. No wonder the chief engineer, a practical railway man, says he does not think it will pay to build such a line.

Items not included in estimate of the Board for a sea-level plan or for the +85 of the Commission and minority.

On page 58 of the report occurs the following statement: "Total, \$247,021,200.

"The Board is confident that the Panama Canal can be constructed and completed under the plans set forth and recommended in this report within the preceding total sum of \$247,021,200.

"There are certain items of cost, such as construction of military defenses, naval stations, government of the Canal Zone, sanitation, light-houses, buoys, lighting, and the provision of tugs, lighters, derricks, dredges, scows, etc., which have not been included. They are common to any type of canal."

From this it appears that in addition to sanitation and Zone government there is omitted: Naval basins, buoys, lighting, tugs, lighters, dredges, scows, etc.

All these things are requisite to make the canal an operative national concern and were estimated in project B at \$1,680,000. (See p. 264, Bates project.)

Comparative concrete in locks and barrages.

[All 1,000-foot locks, except +85—900 feet.]

Lock.	No.	Bates B.	Unit price.	+ 85.	Unit price.	+60 Board.	Unit price.	Sea level.	Unit price.
		<i>Cu. yds.</i>		<i>Cu. yds.</i>		<i>Cu. yds.</i>		<i>Cu. yds.</i>	
Balboa	1	600,000	\$10.80		\$8.00	18,750			
Gatun	1	610,000	10.985	1,800,000	8.00	640,000	\$8.00		
Bohio						18,750	8.00		
Pedro Miguel	1	590,000	11.07	552,750	8.00	628,000	8.00		
Sosa	1	611,000	10.80	828,650	8.00	18,750	8.00		
		2,411,000		2,681,400		600,000		490,000	\$8.00
Gambos		230,000	21.50			18,750		490,000	
Alhajuela		80,000	15.00			600,000	8.00	\$6,000,000	8.00
Cano		80,000	19.00			197,000		(?)	
Giganté								(?)	
Total		2,851,000		2,681,500		2,740,000			

NOTE.—The unit price in project B includes all auxiliary work and mechanism at the locks.

It is further seen that the approximate quantities and lock costs agree very closely for single locks—the difference being merely due to minor questions of design. To make the locks of the +85 comparable with the others as to quantities, one must add 10 per cent, making a total of 268,140 cubic yards and adding about \$2,250,000 to the estimate for this minority type.

MILITARY ASPECT OF END LOCKS.

It is held to be the legitimate conclusion from the following analysis, that any and every canal here is vulnerable in so many ways that it is a serious mistake to sacrifice to a hypothetical military benefit which in reality does not exist, the highest commercial service of the waterway.

One variation of the minority plan would move the Ancon-Sosa terminal locks to Miraflores, and having moved the Pacific locks, the canal is judged safe when in the center of three lines of possible fire and when on the Atlantic side there is a huge staircase of three locks,

making a target three-fifths of a mile long and 250 feet wide, in Gatun Hill, fronting the Caribbean and 3 miles from Limon Bay.

The Chief engineer testified as follows before the Senate committee subsequent to his letter of January 26, to the Commission:

"I proposed about the same elevation—I think I said 80 feet—for the high-level canal, as is proposed in the minority report, and I proposed putting my entire lockage system at the south of Pedro Miguel and Miraflores there together, with this idea in view: That the locks at that point will be from $8\frac{1}{2}$ to 9 miles—we will say 8 miles—in a straight line from the nearest point where a ship can lie, providing she reduced the fortifications in the outer harbor. In other words, she would come up the mouth of the canal and could lie there, but she would have to throw a shell 8 or 9 miles before she could strike anything that she could damage.

"The same condition prevails exactly on the north end, with the dams at Gatun. It is about 8 or 9 miles to where a hostile ship could lie, unless she came directly into the canal. She would not have anything to shoot at. My notion is that, with a small object like a lock lying at an unknown point—unless the enemy had absolutely correct charts—a ship would have pretty hard work to do any damage at that distance."

The supposition that "after the harbor fortifications were reduced" the war vessel would not enter the canal, but would lie off only "8 or 9 miles" and shoot fatuously into the jungle is surely interesting as a warrant for spending more millions than all Alaska cost to dig through the slime-covered morass and buried rock ridges of the lower Rio Grande Valley. The practically minded admiral or general who "reduces the harbor fortifications" of Limon or Panama bays will reflect that he does not then need to shoot at locks, but rather must hasten to save them from the defenders, as the Japanese tried to save the docks at Dalny.

Another proposal is to slew the Ancon-Sosa lock so that it is nearly at right angles to the line of the canal, making every ship passing through for all ages turn around to enter and leave.

It is time, certainly, to reflect. There are no mysteries in the science of military offensive. Every admiralty will know to a dot just where the locks are, and precisely their relation to the zones and angles of fire and to the principal modes of attack from the sea. There are four ways that locks can be disabled from the sea.

(1) By gun fire.

Noting the progress of the past decade, the power of the present 12-inch and 16-inch guns, the constantly increasing range, the terrible accuracy developed, and the certainty that range and accuracy will increase, it needs small prevision to register the certainty that the $3\frac{1}{2}$ extra miles from Mindi to Gatun or the 4 extra miles from Sosa to Miraflores offer no tangibly greater security at the latter places from a 12 or a 16 inch gun shooting 10 or more miles.

It is well to note that the Commission, including four members bearing in their titles the evidence of military training and one actively experienced in defending the siege of Vicksburg, agree with both the Board and minority in not taking to the hills at Miraflores to "hide their locks."

(2) By dirigible balloons.

What does it matter to the new French dirigible dynamite air ships, one of which lately circled over the defenders of the border forts of Germany, whether their objective lock is on the shore or a few miles from it? A hostile fleet, without "reducing the harbor fortifications," could send fifty such balloons over any part of the canal's 47 miles.

(3) By submarines and torpedoes.

These constantly improving weapons of naval warfare, in daring hands, may be utilized. The locks most exposed are those of the minority at La Boca, because attacks could be launched from a wider zone. The tide lock of the majority is partially defended on the flanks by the low rock walls, which the latter suggest, parallel to the inner end of their approach. By far the best defense from this sort of attack would be the breakwaters inclosing the harbor. These breakwaters would compel such attacks to run the close gantlet of the channel between the islands and a boom across the entrance, while the other plans omit these, and their locks can not so well be defended by booms, nor can the enemy be so easily discovered.

(4) By stone ships.

The breakwaters likewise are evidently a better protection against these desperate ventures for blocking the channels than the meager provision of both the Board schemes. The breakwaters force such craft right between the point-blank cross fire of the island forts.

The true policy, military as well as commercial, is to build the best canal that science can evolve for navigation, and hold this isthmian gateway of the western continents. Make it of such a nature that its risks are averaged over a number of easily repaired units, not concentrated, as in one huge dam or flight of locks. Make the breakwaters and the inner fresh harbors; fortify the terminals and salient land points so effectively that the United States can not be dispossessed. The millions proposed to be invested in making a worse canal by moving the locks inland will be better employed when dedicated to creating suitable naval stations at each end and defenses that can not be reduced.

CRITICISM OF THE LINDON W. BATES PLAN BY THE BOARD OF CONSULTING
ENGINEERS.

It behoves an engineer responsible for certain proposals fairly and squarely to meet any honest technical criticism. With the analysis made by the Board much time can be spared through eliminating the nonessentials.

The first paragraph, for instance, does not require refutation (p. 26):

"Mr. Bates presents three projects, designated A, B, and B'. 'He does not appear to attach great importance to the elevations of the lake surfaces shown in those projects, as the latter are modified to almost any extent under his general presentation.'"

Its general tone gives the impression to one not familiar with the plans that they are vague, uncertain, and merely general. That this is not the case is a matter of record. As well as outlining a new system of treatment, the project definitely gives with full detail the particulars of project B. The elevations are definitely given as Lake

Chagres 33.5 feet, Lake Gatun 62.5 feet, and Lake Panama 26.5 feet. Therefore, the first paragraph gives a *false* impression. It is not an engineering criticism to be combatted, because the presentation of September last from the first page to the last (p. 168) was a discussion and analysis. From that last page is quoted the conclusions reached—page 168 of "The Panama Canal system and projects:"

"Lockage being practically the same, therefore, for the two projects A and B, and over 50,000,000 tons, the preponderance of advantage, unless it be decided that the level of A can be advisedly raised, lies with project B with a Gatun dam.

"Therefore that application of the author's system which is incorporated into project B is the one which were best adopted for the American canal."

The second observation begins (p. 27), "The feature of terminal lakes is not new," etc.

Now, originality is not an engineering question which this Board was convened to consider. It is a personal question and, as it has been treated, is here passed.

The remainder of page 27, down to the middle of the page, is devoted to an inexact description of the Bates preferred project B. It is of no particular value to make corrections of features presented at length in the original report, so these, too, are passed.

After this description (middle of p. 28) comes the discussion of the Atlantic terminal harbor. This is an important matter, and it will be treated after the points on which no comment is necessary have been eliminated.

Following the discussion of the Atlantic harbor and breakwater (top of page 28) is a review of projects A at 27-foot level and B' at 97-foot level, and the record of the Board's disapproval. No issue shall be taken here and now with their conclusion. Various considerations (among them that this A is the only easily transformable canal and at some certain summit level it is as cheap as B) make this, the two-lock, terminal lake canal, project A, worthy of note. But as the Board attests, B was the project the speaker himself *qualifiedly*, as above noted, selected as furnishing the better canal. Here on the threshold consideration of the other is not given.

It is considered unnecessary to discuss the statement on page 30 that drowning the fever swamps under 27 to 62 feet of fresh water would not improve the sanitary condition of the Zone. The statement there is markedly questionable, and it is put forward as a *defense* of the sea level, not as a criticism of the lake canal. So it, too, is eliminated from consideration.

A final criticism to be eliminated from discussion is that on page 29:

"Mr. Bates has outlined no method and has apparently given no consideration to such procedures as would be required to transform his project B into a sea-level canal."

And pray, why should he? In preparing his project he has certainly not troubled himself about transforming to a sea level. He was seeking the very best and safest and most perfect canal he could devise. He is reproached because he did not supremely make procedures and estimates to transform his canal into what he considered a vastly inferior waterway. The whole Board having condemned project A, also condemns the whole idea of transformation and then register their disapproval that he did not include such provisions.

The fundamental law at the base of all justice is that a jury must be without self-interest, previous bias, or commitment. What can be said, therefore, of a body sitting upon such a world problem as that of the Panama Canal, seven of whom are passing judgment upon their own projects? That the issue was "predestinated" needs no further evidence than the Board's own criticism here (page 29).

Thus narrowed down, the engineering grounds on which the Board voted down project B are in all four propositions. After five months of study the combined bodies condensed into these paragraphs all the adverse judgments that they could collect. Since they voted unanimously "The Board disapproves the adoption of project B," the arraignment ought to be of some technical weight and conclusive. Turn first to the foot of page 28. Four paragraphs consider prices. The one specific impeachment relates to "excavation." The writer, as does every experienced executive, includes in this its corollary "embankment." He was and is under no obligation to use the unit prices or methods of estimating employed by others.

However, to illustrate the accuracy of the Board's "analysis," the following table is subjoined, taken from the details he gave (pp. 262-263, Board report).

The Board write (p. 20):

"The items of excavation given in his supplementary 'Graphic diagram of approximate quantities' appear to be less than those which the Board would estimate for the same purpose, but if the unit prices adopted by the Board be applied to the quantities for project B, as given by Mr. Bates, the total cost of excavation alone, after deducting the useful French work, will be \$85,289,500."

Excavation and embankment—project B.

[Table, pages 262-263.]

Section.	Quantity.	Price.	Amount.
40-foot contour to shore 600 feet wide	11,250,000	\$0.167	\$3,420,000
Shore to basin	2,500,000		
Basin to lock	20,600,000		
Dam, Gatun	1,000,000	.275	275,000
Pedro Miguel	1,000,000	.47	470,000
Mindi to Pedro Miguel	73,000,000	.8185	59,750,000
Extra excavation (to cover lack of cross sections)			10,000,000
Panama Harbor	15,430,000	.22	3,394,000
Pedro Miguel to Sooa	9,400,000	.32	3,000,000
Old canal	1,000,000	.15	150,000
Chagres dam	2,000,000	.15	400,000
Do	1,000,000	1.00	1,000,000
La Boca dike	1,300,000	.80	880,000
Limon Bay	666,000	1.50	1,000,000
Naval basins	3,000,000	.16	480,000
Railway banks (Item VII)			60,000
Do			250,000
Miscellaneous (Item IX, page 163B)			980,000
Total			85,019,000

What further comment is necessary? Alone, unaided, paying his own staff, the writer's estimate is within this very trifle of that made by the Board with all the resources of the nation at command. In an estimate of over eighty-five million his figures receive here ample justification. Further on in this review the writer will present fur-

ther and convincing evidence of the baselessness of the other "comparisons" regarding dams and locks and quantities and prices to which the Board have subscribed.

"Inundated land values" is the next count.

The same criticism is repeated against the +85', which also submerges some of the higher agricultural land which has a certain value. B submerges almost exclusively terminal swamps. The 85' estimates for the outside value of their submerged land \$300,000. If theirs, inclusive of tillable areas, rates at but \$300,000, the Bates submergence must be materially lower. He considers that the benefits accruing to the Panama Republic from the covering of its pestilential morasses and the inland navigations of the new lakes would amply compensate for land values. There would be some parity adjustment, of course.

The Board finds Mr. Bates's estimate for his canal over low, and states that its construction will demand \$160,000,000. The cost would certainly mount to \$160,000,000 under the present management. Indeed, it would be vastly exceeded. When the speaker named this figure he named it not for a body of commissioners executing work under the system and with the order of intelligence and experience they employ. He was at the very greatest pains to announce this (pp. 160-161):

"This summary gives general estimates in regard to comparative cost. The writer is of the opinion that detailed estimates have little value unless based upon the contract system upon definitely selected plant and methods and upon a precise programme of execution and payment. It can not be too clearly realized that the unit costs of building structures, of making the excavations, and of distributing the spoil must and will vary greatly in the various projects and according to the means and methods employed and whether the contract or Government eight-hour-day work system be pursued.

"It is under the assumption of a contract system, with the greater economies and efficiency which it insures, and embodying his own experience in encountering hydraulic problems at home and abroad into his purposed means and methods that the writer makes for himself his schedule of unit prices and arrives at the table of costs.

"He submits that his plans can be best executed by an organization having an adequate capital which will enable the whole work, engineering and executive, to be responsibly undertaken under proper safeguards for the following definite sums per statute mile as and when completed, the canal reckoned as 40 miles from sea to sea, government, administration, sanitation, and policing costs not included."

Further, to the Board, he detailed the basis as follows (Board Report, pp. 261-262, items I to VII):

"The prices herein presented are based upon the following premises:

"I. A contract for the engineering execution of a definite project, with a proper programme of execution, with acceptable terms and times of payment, under suitable guaranties and proper inspection.

"II. Free right of way for all operations; exemption from taxes, dues, duties at the Isthmus, imports of United States Government, Republic of Panama, State or municipal charges of any kind.

"III. Free use and consumption for general purposes of all Gov-

ernment property, material, plant, etc., at the Isthmus, or purchased therefor.

" IV. The free use of Panama Railway and its property through a contract with the Government to execute its public service, to transport passengers, freight, mail, express matter, locally and across the Isthmus, for fixed prices per passenger and ton mile; to equip, extend, maintain, and operate the railway for the time of canal construction, the Government to take care of the bonds. All through rates of traffic agreements to be abrogated and a spot-cash system at the Isthmus substituted.

" V. The government of the Zone to have the care and expense of hospitals, sanitation, and policing, and regulation of the liquor traffic.

" VI. Contractors' employees to work and to be paid by the hour.

" VII. Reenforced concrete to be employed in structural designs, where practicable instead of masonry or solid concrete. Designs to be approved by Government."

He states as clearly as the English language can state anything that his estimates were not at all those which the canal under its Commissioners would require. They were those which he individually as a contractor would quote for the building of the waterway under his own methods. The test of all prices is on the finality, what men will contract and put down money to execute and deliver. He set his estimates up against that supreme, that final, that unchallengeable test. To its logic there is no argument; from its verdict there is no appeal. He rested the question of his canal's cost there, and on the canal finances as they were publicly supposed to exist in the summer of 1905. Since then "a river of money has run under the bridge." At least \$16,500,000, perchance much more, has gone into a "fixed investment," whose real value to any project is a fit subject for reflection. Commission methods and calculations include certain indulgences of expense which a contractor would expect to forego.

The writer did not reckon upon buying steamships for nearly 50 per cent more than their value, steam dredges, shovels, and locomotives, and a world of stuff before determining the type of canal or a programme of methods and execution. He did not reckon, for instance, upon some purchases reported to have been made by the Isthmian Canal Commission.

Serial No. 207, of April 15, 1905, bids for which were opened May 12, 1905, in class 12 a requisition for 104,000 pairs of butt hinges, and again in Serial No. 289, of November 20, 1905, bids for which were opened on December 8, 1905, we find in class 28 nearly 84,000 pairs more of the same article, making a total of 188,000 pairs. There were also purchased on open purchase requisition by the New York purchasing agent of the Canal Commission prior to April 15, 1905, about 60,000 more pairs of T butts and strap hinges.

One pair of hinges is all that is necessary to hang one door or window, so that provision is herein made for about 250,000 doors or windows. This is a devotion to the open door—to 250,000 of them!

Again, in Serial No. 289, as above mentioned, hinges were specified as "bronze plate on steel." The difference in cost between these and the plain steel for the quantity specified is approximately \$5,000. A costly open door!

In Serial No. 207, class 11, of the same dates as above, there are called for 117,500 steel set screws in quantities of 2,500 of each size from three-eighths to 1 inch in diameter, and also 130,000 hexagon cap screws in all sizes from one-fourth to 1 inch in diameter. Such a stock of set and cap screws could not be found in any factory or warehouse in this country. In fact, many of the sizes had to be made up specially. The writer does not employ a dozen on a \$250,000 dredge.

Just exactly what use there could be for such a quantity of this material it is hard to imagine, especially as there is very little machinery being built on the Isthmus.

In Serial No. 216 of April 19, bids for which were opened on May 17, 1905, we find specified in all 2 100 rail saw machines of the "Bryant" type. These are small machines, operated by hand power, using circular cold cutting saws. They are needed by section gangs and track layers. This number would allow two machines per mile on the Panama Railroad. The great railroad systems of the United States do not have ordinarily more than one machine of this type to every third section of 5 or 10 miles. The approximate cost of this class was \$10,000.

In the same Serial No. 216, in class No. 28, were specified 5,916 dozen files. These were of all kinds, including different shapes and cuts. They took in practically the entire file list from beginning to end. The quantities on the items specified were away out of proportion to commercial practice, as they ordered the same quantities of all lengths. Ordinarily where 100 dozen of 10, 12, and 14 inch files are specified 25 dozen of 4 and 6 inch are ordered and 10 dozen of 18-inch, and usually a larger quantity of 8-inch than any other. The enormous size of this requisition makes one wonder what unwonted office files are to serve on the Isthmus. It is safe to say that there is no manufacturing concern in the United States that could use this quantity annually.

In Serial No. 216, class No. 34, there were specified 19,000 pounds of various kinds of steam and water packing. With only a few steam shovels, a few locomotives, and a small number of stationary engines and boilers, this amount of packing was excessive. There was also purchased on August 17 2,500 pounds more of packing, as was called for in Serial No. 265 of August 7. Still another item was for thousands and thousands and then more thousands of handsaws 26 inches long.

The above are only a few purchases which show the extreme carelessness, or possibly lack of knowledge, with which these requisitions have been made, passed upon, and purchased. These items are merely in the line of supplies. It is probable that the machinery department will show up even more glaringly.

Further, in making his price the writer did not reckon on handing his fuel item over to other mercies or in negotiating with any country but the United States. Making now again his reserves, and believing nevertheless that there is a sure way out of this Cretan labyrinth, he turns to a more agreeable topic.

After disapproving "B" the Board naively observes that the difference between "B" and the Board's recommended 60-foot "is not great." "Such difference as exists is found chiefly in the more costly structures of Mr. Bates's project, such as the dam and spill-

way at Pedro Miguel and the works of the Obispo triangle and in the effective system of control of the Chagres flood." The difference between "B" and the majority's "60-foot" design is here categorically defined. It consists not in difference of principle or places or hazards or engineering perplexities, but in difference, they claim, of costs. This is the most important statement in the whole review, for it settles beyond controversy by the assertion of the Board itself that the inferiority of "B" over their 60-foot is as announced, viz:

1. Great cost of dam and spillway at Pedro Miguel.
2. Greater cost of the works at Obispo triangle.
3. Less effective control of two low dams which let the water run out than by one high dam which holds it imprisoned.

The cost of the dam and spillway at Pedro Miguel is given in his estimate (p. 262) at \$7,000,000. The cost of the concrete structure, etc., there, as given in the 85-foot estimates, is (p. 97) \$7,288,000. The Bates constructions are cheaper by \$288,000.

TERMINAL HARBORS.

The next judgment is, "His harbors are ambitious." He accepts the adjective with all that it includes for him and for them. Terminal facilities are an integral and indispensable feature to this waterway. They are as vital to it as its dams or its water courses. No ship can enter or leave the canal till right preparations are made to receive and to safeguard her.

The Spooner Act is explicit as to provisions and adequacy. Nature in the possibilities of the conformation at Panama had been propitious. The writer accepted her favoring lead and provided worthily for this world's canal.

The Bates harbors, with their combination of salt and fresh water, were unique and single, and unmatched in all the reaches of the globe. In size, availability, and serviceability to commerce they were the most perfect he could conceive. Further, his estimates provided and included them.

How do the others comply with the Spooner Act? What have they provided? Practically nothing at Panama. The International Board convened to settle, once and finally, all problems for Panama decide to not consider these at all. The minority does not so much as *locate* its Atlantic terminus. If it shall be at Colon, or at the lock site 8 miles away from Colon, or at some spot between, it does not deign to say. Yes, in comparison with what the Board considered necessary and in measure and degree to their creations, his harbors for the Panama Canal were indeed "ambitious."

The Board believes finally (see also last paragraph, p. 29) "that the proposed method of control of the Chagres by a number of small reservoirs at Gamboa and above that point on the river will be less effective and more expensive to maintain than that resulting from the construction of a single larger reservoir with a 180-foot masonry dam at Gamboa." What number of small reservoirs does "B" propose at Gamboa?

It proposes one undersluice dam at Gamboa and one undersluice dam at Alhajuela—two, each the same height as the Assuan, in Egypt. These and these alone are the constructions designed for the control of the upper Chagres, so these two dams are the sole elements

whatsoever which concern the Chagres under Project B. The criticism of the Board is therefore that two are "less effective and more expensive to maintain" than one single larger reservoir with a suitable dam at Gamboa.

How are two empty reservoirs with controlled outlets less effective for accommodating a flood than one full one, whose surface has to be "depressed?" What weatherwise formula will tell when to depress the high lake which they propose and show? This is a simple untechnical question of averaging risks. If any accident befalls their monumental Gamboa dam, they have no second guard, whereas to the normally empty first one at Gamboa Mr. Bates has as outer defense, in case of accident, a second normally empty one at Alhajuela. Now, which is probably the safer arrangement—two dams and a lake +62.5, or one great structure? Each man can estimate for himself. As to the expensiveness, the two low dams were figured at \$5,470,000, using high unit prices. The Board gives as the cost of its one Gamboa dam \$6,000,000, so the Board's own figures are against its statement regarding costs by \$530,000.

The writer entertains no doubt that any contractor would rather build his Alhajuela and Gamboa dams together for \$5,470,000 than their Gamboa dam for \$6,000,000, as the volume of concrete is far less if a concrete dam is adopted. This point the Board leaves open.

The second difference lies therefore in the more or less efficiency of two empty basins over one full one. We revert now to the four lines on page 29. We quote:

"It is the further judgment of the Board that the proposed designs for the dams, dikes, or barrages proposed to be constructed at La Boca, Mindi, Gatun, or Bohio do not show the incorporation of such features of construction as will give reasonable assurance of their stability or efficiency for the purpose contemplated, and that a proper provision of those features would greatly swell the costs indicated by Mr. Bates."

Here is a very vital challenge, one which, if founded in good faith and as a deliberate engineering judgment, would be a most serious consideration. What, then, can be said to this judgment pronounced by men who incorporate into their own designs the very same orders of dam and barrage, build them to two or three times the height, on the exact same foundations? Can such a procedure be justified in any way? "The dams or dikes at La Boca, Bohio, Mindi, and Gatun." There is no dam at Bohio in project B. As his text asserts, Mr. Bates after systematic discussion eliminated a dam at Bohio. At the other three sites the Bates designs are of the best Holland or Morrison type. Both are given on Pls. X and XI and in exact detail in Pls. VI and VII, the sheet piling being distinctly visible. Dams are not built without "preparing" the ground, and certainly no man whose money was guaranteeing a structure would be likely to fail to prepare the site in making ready. This preliminary work is noted and detailed in the estimate (p. 262). The stripping, so far as practicable, is done by hydraulic dredges, as is the writer's custom.

Now note. It is written that Mr. Bates's regular world-old Morrison design does not give assurance of stability. Well, does the entire integrity of the 85-foot canal rest at Gatun on a Morrison-type dam, whatever new name may be given it, with three times the

head which project B employs on the same site? If it is questionable for a height of 75 feet or 80 feet with a *net head* of but 29 feet, as advised for Gatun, why in the name of sanity is it recommended for a *135-foot dam* there holding back an 85-foot lake?

The minority has on the Panama side three dams of a similar character, with a maximum head of 65 feet and totaling over $2\frac{1}{4}$ miles. (See plan.)

BARRAGES.

These of "B" are of the undersluice type, an existing instance of which is in visible operation at Assuan, in Egypt. The 85-foot incorporates here again the selfsame undersluice type at the selfsame Gatun. Mr. Bates's undersluice barrages are lower than all the others. He put in three dams of this order—at Gamboa, Alhajuela, and Cano—founding them in each case upon *rock*.

The sea level has put this same type dam at Gamboa for the discharge into the canal when the Chagres would be in flood, and an under-sluice barrage near Corozal to let "one-third" of it out. Four instances! So the criticism is certainly not justified from either majority or minority.

Let us see now, on the other hand, how the sea level carries the Chagres. It has diversions parallel to the canal on both sides and separated from it by artificial dikes or levees forming literally earth dams dozens of miles long, with the two new rivers higher than the canal waterway. There is no pretense made that these rushing streams are confined to their beds by rock fills equivalent to what is incorporated into the Morrison type. There is no disguise of the fact that this whole system of dikes is mostly founded upon erodable alluvium.

Both parties therefore are shown incontrovertibly to be using the identical dams under the identical conditions, but to be making them vastly more perilous and unsafe.

This, then, finishes the verdict upon "B."

BOARD'S +60 LOCK PROJECT.

We turn next to the lock project which the majority recommends. They write these words:

"This project (Bates's 'B') is less well adapted for transformation to a sea level than the lock plan with a summit level of 60 feet above mean tide, adopted by the Board for comparison, *although the difference between the two is not great.*"

Indeed, the writer would be startled at the similarity if he had not already analyzed its possibilities long before the Board was convened.

This, by a vote of 9 to 4, is denominated the best possible lock canal. It was substantially a sea-level vote. This is not the best lock plan, although it is better than the +85. A huge Gamboa dam lockage capacity, limited to the rain that falls above Bohio, more excavation below Bohio, 3 miles shorter lake, and 3 miles more of uncovered morass, no Panama reclamation, no Panama breakwaters or silt-protected entrance, etc. The writer recognizes the likeness, but sees no reason to indorse the decision that it is the best.

The outer Colon Harbor (p. 28) is here to be considered in connection with the subject of the costs. As a reason for rejecting the costs estimated by Mr. Bates, the following is given (p. 29):

"The extended examination which the Board has given to Mr. Bates's Project B fails to indicate that the work * * * can be completed for a sum much less than amount 50 per cent in excess of his estimate of \$134,000,000, including the additional cost of the outer breakwater at Limon Bay," etc.

Mr. Bates declined with emphasis to father the 27-year-old chimerical and extravagant project for breakwaters across the mouth of Limon Bay, which was resurrected by the engineering committee of the Walker Commission in January of last year. The recommendation of this committee, who also sign the majority report, was as follows (vide p. 294, Isthmian Canal Report of January 8, 1906):

"For these reasons the committee unanimously recommend that plans and specifications be at once prepared for a breakwater extending across the mouth of Limon Bay, approximately on the line drawn from the light on Toro Point to the Colon light. This breakwater will probably be designed in two parts, each about 4,000 feet long, with an opening between them 700 to 800 feet wide for the entrance of ships."

This plan the writer especially deprecates in his "System and projects," as follows (pp. 97, 98):

"Throwing two great arms across the mouth of the bay * * * is superficially an attractive project. Such breakwaters possess the advantage of making it easier and cheaper to dredge the approach, but it means the greatest ultimate expense, as stone spoil must either be hauled long, unnecessary distances or be quarried specially for the purpose. The latter must involve very great expense, as these breakwaters are founded in the deepest water and must be of much greater volume to resist the sea. The cheapest and best breakwater will be, as indicated, off Mindi Point, because it is founded in shallow water."

To the estimated cost of his project the writer declines to admit that of a breakwater rejected by all, superfluous to his plan.

SEA-LEVEL CRITICISM—TIDE LOCK AT PANAMA.

As premises, we quote Board report, majority, minority presumably assenting, as they do not disclaim their participation in the responsibility.

Board report (p. 56) reads:

"The question of the necessity of a tidal lock at the Panama end of the canal has been raised by engineers of repute, but the limited time available to the Board has not permitted the full consideration of this question which is desirable. It is probable that in the absence of a tidal lock the tidal currents during extreme spring oscillations would reach 5 miles per hour. While it might be possible to devise facilities which would permit ships of large size to enter or leave the canal during the existence of such currents, the Board has considered it advisable to contemplate and estimate for twin tidal locks near Sosa Hill, even though the period during which they would be needed would probably be confined to a part of each spring tide."

"The highest recently recorded range of spring tides which the Board has seen (September, 1905) was 19 feet 9 inches between extreme low and extreme high water, while from 1882 to 1887 the highest amplitude reported was 20.93 feet. With such tides for a brief period at dead low water there would be a differential head of about 10 feet—that is to say, the water in the canal would be 10 feet above that in the bay, while at extreme high water for a correspondingly short period the level of the water in the bay would be 10 feet higher than that in the canal.

"At the period of mean tide there would be no difference of level between the bay and the canal, so that during that period of the tide all the gates of the tidal lock could be open, leaving an unobstructed passage for vessels until the approach of the flood tide rendered it necessary for the gates to be closed until slack water would again be reached, and so on for each succeeding spring tide. During neap tides the range is so small that it will not be found necessary to bring the gates of the lock into use. Consequently throughout the neap period of each tidal cycle a continuously open and unobstructed passage for traffic will be provided through the tidal locks.

"If the matter be put into figures for the sake of comparison, it will appear (1) that in the project for the sea-level canal one lock may be required at times at the Panama end of the waterway. For one-half of each tidal cycle of fourteen days the gates may be operated to control a difference of head of an average height or depth of about 8 feet for short periods on each tide, while for the remainder the difference of level between canal and ocean will be negligible. For the remaining half of each tidal cycle the gates will be out of operation and the locks will present an open and unobstructed channel, and (2) that in the project for the lock canal six locks or even more will be required for a canal with a summit level 80 to 90 feet above the mean level of the sea; that these locks will have differences of level ranging from about 27 to 35 feet; that their operation will be perennial, they will always be required, and consequently that the menace which they will present to the safe navigation of the canal by large steamers can not be avoided and will be cumulative, i. e., must be multiplied by the number of lockages to which such vessels will be subjected during their passage through the canal."

This is supplemented by the leading expounder of the sea-level majority before the Senate committee, March 8, 1906.

"Q. Would not the same objection apply equally to a sea-level canal where you had to pass a lock gate to get into it?"

"A. No; it would not, Senator. One-half of the time the tidal gates would be wide open, and the ships would simply pass in as fast as they arrived, one after the other, and during the extreme tides, when the lock would have to be used, it would be a single lock, like the St. Marys Falls, but with only half of the lift of that lock—that is, assuming that the tidal lock must necessarily be there, and that is what we do assume. So that there could be no such congestion with a sea-level canal, and that is, to my mind, one of the most important elements of the whole question."

We have had a further "exposition" of this principle by a well-meaning author. The gentlemen are a bit misled; they are discussing the flow of water, evidently without experienced regard for the

conditions and safety of navigation. The canal is built for commerce to flow, not for water to flow.

Turn to the very example on which this argument is based.

Here is an official map of the Manchester Canal, obtained in Manchester from the canal corporation not sixty days ago. In the general description, on the upper center of this map, we read:

"The tidal portion from Eastham to Latchford locks (21 miles) is maintained at a minimum level of 14 feet 2 inches above Old Dock sill (or 9 feet 6 inches above ordnance datum—i. e., mean sea level)."

Please note the canal level is 9 feet 6 inches above mean sea level. The average high water of neaps is 11 feet 7 inches above mean sea level—i. e., 2 feet 1 inch above the canal level. The average high-spring tide is 18 feet 10 inches—i. e., 9 feet 4 inches above mean sea level (vide map, lower left corner).

Now, in order that the canal corporation should get a charter from Parliament, it had to agree to keep the lock gates open *at all stages* of neaps and springs above +9 feet 6 inches—the canal standard level; to close the gates at the moment of high water, and to allow the tidal prism thus impounded to escape (down to the canal's standard level, 9 feet 6 inches above mean sea level) through sluices, emptying into the upper reaches of the River Mersey.

The canal advocates fought tooth and nail to avoid the insertion of this provision in the act, but the Liverpool interests demanded it as the price of the bill, in order that this tidal volume might be utilized to increase the *scour* through the lower Mersey and its ocean bar.

The writer is familiar with that Manchester canal tide lock. He has watched the operation and discussed the situation with men in daily and hourly contact with it.

First. No water is allowed to *flow out* through the lock gates at ebb tide. All vessels lock out at the period of ebb tides, whether the water in the Mersey is above or below the canal datum (9 feet 6 inches above mean sea level). The gates are not open at the ebb.

Second. When the tide is coming in (is flooding)—whether neap or spring—and the gates are open, by force of or in compliance with the law, *no vessel ever essays to enter*.

It is too dangerous to enter a lock *with* the current. A lock can be safely entered only when there is slack water or an opposing current.

Just as in the Manchester, so in the Panama. No pilot will attempt, no owner will permit, no insurance company will insure a vessel to pass the tide locks *with* the tide, whether ebb or flood, spring or neap. Fancy a new Cunarder worth \$7,500,000 trying to go through a rock-lined passage *with* the current and with 6 feet of margin on either side. It is simply absurd. *Against* the current, yes; the vessel will steer. With the current, absolutely, no.

At the Manchester to-day, therefore, the transit capacity of the canal would be actually increased if that law was abrogated and if the lock *could* be used *all* the time.

A sea-level canal, therefore, with open gates "half the time" is a delusion. It would appear to be time that those "who go down to the sea in ships" and the Lloyds, who insure them, should have the voice which complacency has denied them.

CONCLUSIONS.

RELATIONS OF CULEBRA SECTION TO TRANSIT AND CAPACITY.

The influence of the section from Bas Obispo to Miraflores upon the time of transit and upon the capacity of the waterway to pass vessels depends on four things:

1. There must be a reception and turning basin at the north end of the constricted division.

2. There must be a similar provision at the south end.

3. There must be turn-out provisions, "gares," as they are called on the Suez. At first these can not be over 4 miles apart, but as the number of ships seeking passage increases, intermediate "gares" or *turn-out widenings* must be provided.

4. These relations depend on the length of the narrow rock-walled section, "200 feet wide on the bottom and 208 feet wide at the water line." In the sea-level plan this length is at least over 11 miles from below Bas Obispo to Miraflores. In the +85 and in project B the distance is 8 miles from the Obispo triangle to the reception basin above the Pedro Miguel lock.

Now it appears to have been assumed that all types and sizes of vessels can pass each other in the smooth rock-walled passage presented by the Board. It has been contended that when ships pass one will be tied up to the bank; then the other can pass safely. But this all depends on size. The writer submits that vessels over 65 feet in beam can not and will not be permitted to pass each other in this fashion. One or the other steamer will wait at the ends of the gorge until the way is clear against meeting any ship, and will then proceed, unless "gares" or widenings are provided.

Now these turn-outs ought not to be over an hour apart at the furthest—that is to say, 4 miles.

Consequently the sea-level scheme needs two intermediate turn-outs and two end basins or turn-outs besides. The projects of the writer and fortuitously the +85 of the minority have these end basins, and so require but one intermediate turn-out.

The majority and minority have again here omitted proper and absolutely necessary provisions of this character. Likewise their cost, which will be high, because the cut is deep, is not included. The Bates project gave a "gare" and arranged for its cost.

Even in a "gare" the most vigorous precautions must be taken to keep the waiting vessel in her position because of the *suction* of the passing vessel. If a large ship essays to pass another in the main channel, she is practically entering and leaving a lock, except for the time of lift. She must slow down, crawl at a snail's pace and then speed up, while the other has to stop, make fast, wait, cast off, and go ahead.

It is and always will be extra hazardous for large ships to pass each other in the main part of this narrow section.

Consider two vessels of 80-foot beam. They will be common enough in twenty years. Trace their procedure in getting past each other. One lies 10 feet away from the bank. Her side is 14 feet from the center, leaving 118 feet clearance for the other ship. Considering the tremendous displacement of water caused by a vessel of large dimensions moving 4 or 5 miles an hour and the suction set up, this clearance is not enough.

Therefore without "gares" the 11 miles of the Culebra section becomes equivalent, in time wasted in transit, to a *flight of three locks* like that of the minority at Gatun. The 8-mile Culebra section of the minority becomes, likewise, equivalent to two more locks than the six they have shown.

This is a navigation and canal capacity question. It is necessary to think sometimes, in a canal whose purpose is commerce, of the convenience and safety of ships.

Having reviewed the essential elements of the project for the Panama Canal, the time has come to weigh all in the final balance, not with a prejudice, but with an open-eyed justice. There are two designs which can profitably be compared with the Lindon Bates plan—the sea-level and the 85-foot scheme as evolved by the minority and Commission. Each represents the embodiment of the principles ruling their structure. The decisive question becomes here at the close, first, Wherein is the sea-level canal, as detailed by its latest official advocates, inferior? The answer will be summed up in the following category of defects and objections:

SEA-LEVEL SYSTEM.

Dimensions.—The canal approaches at either end are inferior and too narrow, and too shallow on Pacific end.

Channel.—Most bank length to be eroded.

Highest spoil banks.

Most cost to widen or deepen later when canal is in use.

Diversions certain to be silt clogged.

Dam and spillway system.—The Gamboa dam is a gigantic 180-foot masonry core earth structure very difficult to maintain during construction.

Great head of water up to 170 feet permanently impounded above canal.

Rock foundations not found suitable for core 180 feet high.

Disaster in case of cave in of, failure of Gamboa, Cano, and Gigante dams.

Problematic in construction and operation.

Most lower Chagres diversion work.

Excavation.—Highest cost of excavation.

Most plant.

Most excavation.

Least utilization of French excavations.

Greatest consumption of fuel in construction.

Most pumping during construction.

Greatest difficulties in distributing spoil.

Sanitation.—Least sanitary. Sanitation expenses not estimated, \$15,000,000 to \$20,000,000.

Swamps and disease foci all retained.

Most common labor and incident sickness and loss of life.

Navigation.—A constricted lakeless channel for the whole distance.

Greatest risk to vessels in transit.

"Northers" at Atlantic entrance, able to occasion detrimental currents.

Poorest harbor facilities.

Fewest turning basins.

Fewest passing stations.

Channel section areas not compensated to equalize currents.

Greatest curvature affecting navigation.

Longest transit time.

Least average speed.

Pacific section too shallow and narrow, and reef obstructed.

Financial.—Greatest first cost, \$102,000,000 to \$150,000,000 more than the law of Congress admits.

Greatest expense for interest and maintenance.

Least net earnings.

Highest deficits.

Legal.—Requires additional legislation to overrule fundamental provisions in canal law.

New appropriation needed to cover excessive cost.

Labor.—Most difficult to secure and hold labor.

Not one of these impeachments can be successfully met. The figure is now \$102,000,000 over the amount allowed and considered ample by Congress. Presumably the latest sea-level canal plan represents the best that can be evolved for it. On the facts incorporated into this the indictments stand.

The advantage of the sea level's *one* lock over a *two* or a *four* lock system is too dearly purchased at the cost of peril in each passage through its constricted, rock-flanked cuts; of the slower transit in its lakeless channel; of an extra expenditure of at least \$100,000,000; of the retardation of completion by at least seven years; of hosts sacrificed in the unnecessary excavation through marsh and hill.

+85 LAKE SYSTEM.

Dimensions.—Too small as planned on the Pacific end.

Channel.—Poorer facilities to deal with silt at upper end of lake.

No utilization of the canal cutting purchased by the Government in the section from Limon to Gatun.

Chagres swamps retained for 3 miles.

Dam and spillway system.—Gatun dam nearly three times necessary head—impracticable—of vast size.

Three others at Panama twice the necessary head.

Construction methods experimental and cost too great.

Locks obsolete before begun and too small, and there is no room for three in flight at Gatun.

Lockage.—Lockage supply capacity comparatively limited.

Excavation.—Excavation of very tough clay below 18 feet in Atlantic coast section; unhealthy and expensive; amid Chagres swamps.

Navigation.—Pacific terminal channel too small, and reef in course of vessels.

Less available and contiguous fresh and salt water harbors at either end.

Undue and detrimental currents at Obispo end of Lake Bohio.

Only one fresh-water naval station convenient to termini.

Fifty per cent longer transit line.

More lock leakage.

Sanitation.—Little inherent in plan during execution. Main marshes unsubmerged, disease foci retained, during all of construction; \$9,000,000 not estimated at all.

Financial.—Greater costs.

Greater yearly interest, operation, and maintenance costs.

Legal.—Without nullifying or altering fundamental statute provisions in the Spooner Act the canal can not be built.

New appropriations needed.

Railway practically obliterated.

Safety.—Its dams and locks are unsafe. Its Atlantic and Pacific approach channels are obstructed or menaced by sunken reefs.

Cost.—The cost is underestimated by \$20,000,000 to \$25,000,000.

All of the above indictments and more stand against the 85-foot project of the minority and Commission. These disadvantages, also, are unanswerable, nor have the plans any saving features to redeem them.

COMPARISON OF PROJECTS A AND B.

Since the author's preferred designs furnish several applications of the principles advanced, it becomes conclusively in order to decide of these which will furnish the best canal. The concrete advantages of A over B are, detailed:

Project A.—It is the simpler and easiest to transform by adding to or diminishing the locks.

Its transit time is slightly shorter.

Has fewer locks.

Less diversions of Panama Railway.

No questions of cost and maintenance of the extra locks, dams, sluices, and Pedro Miguel Bypass.

Least care during operation.

Superiorities of project B over A are:

Project B.—Less expenditure.

Quicker to construct.

More sanitary because of third lake.

Less excavation in the central section.

Submergence of the low valley between Bohio and Obispo and all the various constructive and sanitary advantages attending the condition thus created.

Shortening of construction time by a year or more.

Lake Gatun takes better care of the local streams emptying into it than project A can provide.

The lake takes the place of the expanded channel of A from Obispo-Triangle northward.

Less bank length to be maintained as canal banks are submerged.

Less curvature affecting navigation.

More turning basins and natural passing places.

Less pumping during construction.

Lockage being practically the same, therefore, for the two projects A and B, and over 50,000,000 tons, the preponderance of advantage, unless it be decided that the level of A can be advisedly raised, lies with project B.

The level of A can, however, be raised to +35 by incorporating the tandem twin-lock system, and the difference as to cost between A at this level and B, as set forth, will be relatively small. But the advantage in cost remains still to B.

Therefore, that application of the author's system which is incorporated into project B is the one which were best adapted for the American canal.

(Therefore, after a short executive session, the committee adjourned until Monday, March 12, 1906, at 10.30 o'clock a. m.)

ISTHMIAN CANAL.

COMMITTEE ON INTEROCEANIC CANALS,
UNITED STATES SENATE,
Washington, D. C., Monday, March 12, 1906.

The committee met at 2 o'clock p. m. (no morning session having been held).

Present: Senators Millard (chairman), Kittredge, Dryden, Hopkins, Ankeny, Morgan, Taliaferro, and Simmons.

Present, also, Maj. Gen. George W. Davis, U. S. Army (retired).

STATEMENT OF LINDON W. BATES, ESQ.—Continued.

The CHAIRMAN. Mr. Bates, we are ready for you to proceed.

Mr. BATES. Mr. Chairman, I would say first that in looking over the text I find that there are a few errata, of no particular moment, which might be taken cognizance of when the final printing is made. I will say, further, that if it is desired to have this text represented in any way by the plates which I prepared to go with it, the stones (which I have in New York) are at the disposal of the Printing Office.

The CHAIRMAN. Thank you.

Senator KITTREDGE. Mr. Bates, on page 1683 of your statement I find the following:

"The writer did not reckon upon buying steamships for nearly 50 per cent more than their value, steam dredges," and so forth.

Have you any statement to make regarding that?

Mr. BATES. Yes, sir. If I am asked for an explanation of why I made that statement, I will make it.

Senator KITTREDGE. I wish you would.

Mr. BATES. When the *Havana* and the *Mexico* were bought, I made inquiries as to what those vessels had cost and what had been their construction history; and to the best of my information it is this: That when those vessels were to be built there were two prices bid—one by the New York Shipbuilding Company, if my informant is correct; the other by Messrs. Cramp. The first bid was \$550,000, and the bid for the ships by Messrs. Cramp was \$610,000. Those vessels were built in 1898 and 1899. They are, therefore, five or six years old.

It is the custom of the P. and O. Steamship Company, the greatest steamship company of England, to write off—

Senator KITTREDGE. What is the P. and O.?

Mr. BATES. The Peninsular and Oriental Steamship Company, which is the great company running to the Orient, from England to India, to China, Japan, etc. It is their custom to write off 7 per cent per

annum from their new ships; that is, the first year on the basis of 100 would be 7 per cent off; the next is 7 per cent off of the remainder, etc. Now, applying that principle in order to get at the value of these ships, you will find that the real value of those ships was somewhere about \$450,000; and at the time that they were bought they were insured for about that price.

Senator KITTREDGE. What price?

Mr. BATES. Four hundred and fifty thousand dollars. It has been stated that the Ward Line carried some of their own insurance; but I would say, in regard to the point of insurance, that you insure a vessel for two things, usually, what we call "particular average;" that is, in the event your vessel is damaged, that you shall receive enough to make good that damage. Then we also take out a "total-loss" policy, which represents the value of that ship to us as a commercial opportunity, and that may be what the underwriters are willing to make.

For instance, when I insure a dredge going to Australia, I insure for particular average, we will say, at \$250,000 (£40,000), but as against total loss and any prospective profits, etc., perhaps £10,000 or £15,000 more. So that the value of a ship is not the sum of the total loss and the particular average. The real value of the ship is represented by, in a measure, its insurance for particular average—quite a different thing.

I consider that those ships, at the time that they were purchased, were worth, together, about \$900,000, and no more; and when you add 50 per cent to that, you get the price that was paid.

Senator KITTREDGE. Do you base that statement upon facts within your own knowledge or upon information that you have received?

Mr. BATES. The facts within my own knowledge relate to the writing off, etc. The prices that I have mentioned came from an estimator, who was, he claimed, cognizant of the prices which those vessels were bid at when they were originally contemplated for construction.

Senator KITTREDGE. Who gave you the information?

Mr. BATES. It was a Mr. Langell.

Senator KITTREDGE. Where does he live?

Mr. BATES. He lives in Camden, I think, New Jersey. At any rate, he is an employee of the New York Shipbuilding Company.

Senator KITTREDGE. And can you give us any better address than that?

Mr. BATES. No; that will certainly reach him.

Senator SIMMONS. Have you his initials in your mind, Mr. Bates?

Mr. BATES. No, I have not; but I can very easily get them.

Senator KITTREDGE. What is your understanding of what is covered by the original cost of construction? Does that include the furnishings of the ship?

Mr. BATES. It usually does. I bought all my ships in England, including all of the furnishings. Some people do that, and other people provide their own crockery, linen, etc. In my case, in building half a dozen ships at Armstrongs', they supplied everything; and when we went out for a trial trip we went right away on a voyage of 14,000 miles.

Senator KITTREDGE. That depends upon the contract price, does it not?

Mr. BATES. I think so; yes, sir.

Senator KITTREDGE. Do the prices that were given you include the original cost of the ship, or do they include furnishings, as you understand?

Mr. BATES. It would include, I should take it, all, perhaps, except the crockery and linen. If you mean by "furnishings" the chairs, sofas, and everything of that sort, they would all be included in the contract price.

Senator KITTREDGE. What I am getting at is, when you speak of the price of the ship I want to know whether that means the cost of it as it leaves the stocks or when it is ready for a voyage?

Mr. BATES. When it is ready for the voyage or the trial trip, usually. In my case I have always had it absolutely complete; and the shipbuilding yards of the Armstrongs and other yards with which I have built have been great assembling establishments, who furnished everything.

Senator KITTREDGE. Did you receive information of this character upon this subject from any other person than the gentleman named?

Mr. BATES. No, sir.

Senator KITTREDGE. With what company was he connected? I have for the moment forgotten.

Mr. BATES. He is now connected with the New York Shipbuilding Company, at Camden.

Senator KITTREDGE. Is that company in any way a competitor of the company of whom these ships were purchased?

Mr. BATES. I think it is; but, on the other hand, this man had not, I think, at that time, entered the employ of this company.

Senator KITTREDGE. When was the information given you?

Mr. BATES. About the time of the purchase of the ships; last summer some time, as I recall it.

Senator KITTREDGE. What was his business at that time?

Mr. BATES. He had been with the United States Shipbuilding Company, that became bankrupt, and with Harlan & Hollingsworth.

Senator KITTREDGE. In what capacity?

Mr. BATES. The same capacity, as an estimator. He is the man who makes up the figures on which bids are based.

Senator KITTREDGE. That is, for the building of the ship?

Mr. BATES. Yes, sir.

Senator KITTREDGE. Going back to the subject of which you were talking generally on Saturday, from what source did you secure the data to give us the testimony evidenced by your statement?

Senator DRYDEN. Senator Kittredge, before he leaves this point may I ask a question?

Senator KITTREDGE. Certainly, sir.

Senator DRYDEN. Can you tell for what amounts the marine insurance companies had insured these ships at the time they were purchased by our Government, when they were in the possession of the former owners?

Mr. BATES. I made inquiry as to that of one of the firms in New York and was told that it was about \$450,000.

Senator DRYDEN. And do you know whether the marine insurance companies had insured them for what they then considered their full value, or was it only a partial insurance?

Mr. BATES. I assumed that that was insurance for particular average.

Senator DRYDEN. You do not know in what marine companies they were insured?

Mr. BATES. No, sir.

Senator DRYDEN. That is all.

Senator KITTREDGE. Have you in mind the question I asked you? (At the request of Mr. Bates the question was read aloud to him by the stenographer, as follows:)

"Going back to the subject of which you were talking generally on Saturday, from what source did you secure the data to give us the testimony evidenced by your statement?"

Mr. BATES. Do you mean the technical data?

Senator KITTREDGE. Yes.

Mr. BATES. In the first place, I had the report of the advisory board complete. In the next place, I had my own experience and my office data. In the next place, I had as much of the French data as I have been able to accumulate. I presume that I have some forty or fifty books, giving a concise, accurate history of the Panama enterprise from the date of the inception until this time.

Senator KITTREDGE. Have you ever been on the Isthmus?

Mr. BATES. Yes, sir.

Senator KITTREDGE. When?

Mr. BATES. I was on the Isthmus in August, 1904. I left New York, as I recall, about the 26th of July and returned in the latter part of August.

Senator KITTREDGE. Is that the only visit to the Isthmus you have ever made?

Mr. BATES. Yes, sir.

Senator KITTREDGE. Did you make any explorations at that time?

Mr. BATES. Yes, sir.

Senator KITTREDGE. Of what character?

Mr. BATES. I think I can point out on the map there so that you can appreciate just what I did. In the first place, I had, prior to going down to the Isthmus, a desire to take contracts, and I had had before the old Walker Commission at its very first meeting a proposition to fill Colon, raising it above grade, using one of my great dredges in Australia, which at that time was idle. Nothing came of it at that time, but with the consent or the approval, I should say, of Admiral Walker, I went on the same ship with some of the members of the Commission going to the Isthmus at that time, with a view of ascertaining the local conditions, and when we arrived there I carefully examined Colon.

Senator KITTREDGE. In what way did you carefully examine it?

Mr. BATES. I walked all over it. Then I walked away up around here and around to the dry docks on this side, and in a boat went clear up to the canal here as far as the deposits which had been made there by the Chagres, which is about Mindi. Then, another day I went up to Gatun and down this old channel and then back through to Colon, and another time I took a boat at Bas Obispo and went down the river all the way to Gatun. Another day I went all around Panama, Sosa Hill, and this country in here on foot. On another occasion I took a boat and went up the Rio Grande at low tide, going as far as Miraflores, and then, leaving the boat there and having gone through and gone up as far as I could go at low tide, I walked all the way to Bas Obispo.

Senator KITTREDGE. Along the route of the old French line?

Mr. BATES. Along the route of the old French line; and another time when I was there I went over the railway route on both sides of the Culebra cut.

Senator KITTREDGE. That trip, the trip on the railroad, was——

Mr. BATES. That was on foot.

Senator KITTREDGE. Oh, you walked on the railroad?

Mr. BATES. Yes, sir.

Senator KITTREDGE. You did not ride on it?

Mr. BATES. No, sir. Then I went around on the dump trains here, and I watched the old French excavators, etc.—things with which I was familiar. Then I went down to Colon. I would say that I have had a very great deal of practice in observing the topography of water-courses for twenty-five years.

Senator KITTREDGE. Did you go up the Chagres toward Alajuela?

Mr. BATES. No, sir.

Senator KITTREDGE. How far east of Gamboa did you go on that trip?

Mr. BATES. Nowhere east. I was at Bas Obispo, just where I could see the Gamboa site.

Senator KITTREDGE. Did you go up to the site?

Mr. BATES. No, sir; I was on the other side of the river.

Senator KITTREDGE. Did you make any examinations by way of borings to ascertain the character of the material or the foundational conditions for any of the structures you have recommended to us?

Mr. BATES. At Sosa Hill I did not take borings, but I observed very carefully the geology in respect to it, looked up the old French data in regard to borings such as I could get hold of, and I had——

Senator KITTREDGE. Where did you find such data?

Mr. BATES. Some of it at the office of the Isthmian Commission—very little of it; but most of it in the old French records of the liquidators, and in the reports of the geologists, and in the geological profiles across the Isthmus.

Senator KITTREDGE. Printed reports?

Mr. BATES. Yes, sir.

Senator KITTREDGE. Public reports?

Mr. BATES. I have them here. Then I had a Mr. Dougherty, who was one of the finest mining engineers of my acquaintance, reexamine the Ancon, Sosa, and La Boca sites on his way down to South America; and in that connection he spent some time around Panama.

Senator KITTREDGE. How much time?

Mr. BATES. He was there about a week waiting for a steamer, and sent photographs and a special report upon what he considered to be the formation, which confirmed my own view; and I find that the borings which have later been ordered by the Commission show that these sites, which, when I first mentioned them last year, were all said to be mud, really had rock as close, if not closer, to the surface than any other sites for dams and locks on the whole Isthmus, except at Alhajuela.

At Mindi I looked up very carefully the old data of the French, and I observed this Jaramillo Hill and the first cutting which was made by the French when they were digging the canal past that point.

Senator KITTREDGE. To what extent did you have access to the data of the French relative to the Mindi location of a dam which you propose on one of your plans?

Mr. BATES. I had the maps, the profiles, the photographs, and I had seen the location. I was there when the borings were being made which are on one of the maps which I have here.

Senator KITTREDGE. At Mindi?

Mr. BATES. At Mindi and out into the bay, out here [indicating]. There was a boring foreman there who had been on the Nicaragua Canal, and he had charge of the boring party, and he was boring at the time I was there with reference to the new alignment destined to go out into Limon Bay instead of the old line. I got from him this sample that I had on Saturday, and I also got——

Senator KITTREDGE. A sample of clay?

Mr. BATES. A sample of what I should call a clay rock; and I would say that that clay rock, to my mind, approaches as nearly a brick, a half-burned brick, a gray brick, as anything else. I tried yesterday to get a sample that would look like it. I think that the best name for that is really "clay rock."

Senator KITTREDGE. The point I am getting at, is to what extent did you make personal investigations independent of the records of what the French engineers did and of what the Walker Commission and the later Commission and Engineer Wallace did?

Mr. BATES. Those are practically the result of my own observations.

Senator KITTREDGE. Is it observation or is it exploration?

Mr. BATES. It is close observation of what was going on.

Senator KITTREDGE. Had you any instruments there yourself?

Mr. BATES. No, sir.

Senator KITTREDGE. Had you any assistants?

Mr. BATES. My son was with me.

Senator KITTREDGE. You made no measurements, no borings?

Mr. BATES. I took the records that were official as being correct; and I had every reason, from my observations, to believe that they were accurately taken.

Senator KITTREDGE. Do I understand that the information that you have given us here is the result of an examination of records made by the French engineers?

Mr. BATES. Made by both the French and the Americans.

Senator KITTREDGE. I was about to add, the engineers of the old Walker Commission and of the new Canal Commission.

Mr. BATES. Yes, sir.

Senator KITTREDGE. Under Mr. Wallace's direction?

Mr. BATES. Yes, sir.

Senator KITTREDGE. That is right, is it?

Mr. BATES. Every mortal thing that I could get.

Senator KITTREDGE. Is your information based upon any other facts than such as are disclosed from an examination of those records?

Mr. BATES. In several particulars that would have to be qualified. I have Mr. Dougherty's report here.

Senator KITTREDGE. To what extent did Dougherty make that examination?

Mr. BATES. He made it just as any geologist and mining engineer does, by observing the wells, and the character of the rock and making use of his knowledge, just as a man does when he is an expert in a mine.

Senator KITTREDGE. How can he determine the character of the rock?

Mr. BATES. The rock comes to the surface.

Senator KITTREDGE. He can where it comes to the surface; but it does not come to the surface between Sosa Hill and La Boca, does it?

Mr. BATES. No; it does not, I think.

Senator KITTREDGE. Or between Sosa Hill and Ancon Hill, at all points?

Mr. BATES. No; not at all points.

Senator KITTREDGE. Nor does it come to the surface at all points from Ancon Hill to Corozal Hill, does it?

Mr. BATES. No; it does not come to the surface, and of course a man can not see into the ground.

Senator KITTREDGE. I am getting at this point: To what extent did he make an observation? How does he know the character of the rock except as it appears at the surface? Has he any other source of information?

Mr. BATES. There is no other source than what you get by borings and what you can see.

Senator KITTREDGE. Yes; and from the records made by the French engineers and the other engineers whom I have mentioned; that is right, is it not?

Mr. BATES. Yes, sir; that is right.

Senator TALIAFERRO. French and American engineers?

Mr. BATES. Yes, sir.

I have mentioned Mr. Dougherty. I will say that on the site of the La Boca dam I had misgivings; but the man who built or had to do with the building of the piers happened to come into my acquaintance, and he it was who acquainted me with the depth at which rock had been found off the La Boca pier.

Senator KITTREDGE. Who was that?

Mr. BATES. I think the man's name was York, but I can not recall at the moment for a certainty. Then Mr. Paine, of the Railway Age, gave me same data in regard to this section of the Chagres.

Senator KITTREDGE. From what source did he get his information?

Mr. BATES. He had it from personal observation. He probably has done more explorations off the line of the canal than anybody else that I have met on the Isthmus. He was one of the associate editors of the Railway Age.

Then, at the time that the great rush to California was going on, there were several books written in regard to this country between the Chagres and there [indicating]. I happened to have those books, and they were rather vivid in their description of the way the spurs ran down into this valley, and that it was a narrow valley, and the party who wrote this book in particular was one who started for California with a camel train, landed his camels at the old town of Chagres, and endeavored to take them to Gatun by land; and he writes very vigorously of his experiences, and speaks of these spurs and the slipperiness of the clay in this country here [indicating].

Then I happened to have, also, a work written by Captain Peacock prior to 1879, or just at 1879, and addressed to De Lesseps before the Congress. Peacock was a man after the order of Captain Cook—an official British surveyor. He landed in 1831 in this little bay here, which he named on his plans Peacock Bay; and then he writes this book, giving his journal across here to Panama for the route of a canal. I was attracted particularly by the fact that he said he had gone on

foot from this bay to Gatun, and that the way was comparatively level; but of course it is a jungle, and a man may go up 50 or 100 feet without knowing it. At that time this bay in here had 4 fathoms of water—24 feet—and now it has but 6 or 8.

Senator HOPKINS. Whereabouts was it that he had the 24 feet of water?

Mr. BATES. Right in this little bay here—right there [indicating].

Senator HOPKINS. And now it has but how many?

Mr. BATES. Six or 8 feet. This point is called Kenny's Bluff now, but in his records he calls it Point Peacock. He made surveys practically all over the world, and he locates the line of his canal from Gatun right to this bay and makes his terminus there.

Senator DRYDEN. What has caused that decrease in the depth of the water?

Mr. BATES. I think, sir, that it has been caused by the Chagres River going down the French canal and emptying into this bay at Mindi, instead of going down its old route to this point here [indicating].

Senator HOPKINS. Mr. Bates, I want to ask you a few questions about the point there at Gatun.

Mr. BATES. Yes, sir.

Senator HOPKINS. You stated the other day, if I understood you correctly, that a Morrison type of a dam could be built there?

Mr. BATES. Yes, sir.

Senator HOPKINS. I wish you would explain that in detail.

Mr. BATES. Yes. Now, let me get one of my maps right here. This profile here gives the Gatun site with a Morrison type of dam. I call it the Morrison type because Mr. Morrison was its most prominent advocate. It consists essentially of making an earth fill between two rock fills. The first thing that you would do would be to put in your two rock ends of the dam on either side, and then fill in with earth.

Senator KITTREDGE. You would construct it in what way for the rock?

Mr. BATES. The rock may be put in what we call *pierre perdue*—that is, it is thrown in roughly. Of course the first thing that you do with every dam site is to clear off all the vegetation; and if there is any bad material which should not be there, you remove that also, down to what is sufficiently dense, according to the plans.

Assuming that to be done, then you have your rock fills on either side and your earth fill between. Now, then, that earth fill between may be put in in a number of different ways. It may be put in by train or it may be put in by a hydraulic dredge. When it is put in by train it has to be rammed very carefully, put in in horizontal layers, all vegetation carefully excluded, and thoroughly wet down and water-packed, as we call it. When it is put in by a hydraulic dredge the stream of water is the vehicle for the transmission of the material that you put in. It packs hard, just like a sand beach, like the hard beaches in Florida; so that if the material that you are putting in is sand, you can walk over it within a few moments after it is put in. If, however, it is of a muddy, clayey character it sometimes takes days and weeks to sufficiently drain out; and in some cases I have been obliged, in making reclamations, to tile the ground just as you would in a swamp, so as to drain the water through these tiles. Sometimes we put in the tiles beforehand. If you do not do that it

is likely to form a crust; this crust may be 2 or 3 feet thick, and underneath is a perfect jelly. Certain materials drain naturally.

At Galveston, for instance, I am putting in just about half of what is required in this Gatun dam. There the material is a light sand, and it drains off in a little while after we shut off the water. If, however, that material that we were handling was clay, it would not dry out for weeks and months.

Senator HOPKINS. Mr. Bates, have you made an investigation sufficiently exhaustive so that you could know whether or not there are any underground currents that would interfere with the placing of a Morrison type of dam there at Gatun?

Mr. BATES. Personally, I have not; but I have observed such boring information as has been obtained by, especially, the American Commission; and my judgment is that there is no reason at all why a Morrison type of dam with a low head is not perfectly feasible. With a high head I consider that it would become increasingly problematical as you get above 40 feet. Under that you are perfectly safe.

Senator HOPKINS. What do you say about your ability to establish a dam at Bohio?

Mr. BATES. I consider that it is perfectly feasible to put in that type of dam at Bohio; but my objections to it are simply these: that for the ultimate greatest capacity of a lock canal you want all the run-off that falls on the Isthmus.

Senator HOPKINS. Yes.

Mr. BATES. And if you put your dam at Bohio, you lose 43 per cent of your possible lockage capacity.

Senator HOPKINS. Yes.

Mr. BATES. And you can not get it.

Senator KITTREDGE. Bohio is, so far as site and conditions are concerned, just as favorable as Gatun, except the feature that you have just mentioned?

Mr. BATES. It has this advantage, that the dam is not so long. It has this disadvantage, that the ground is probably more porous under Bohio than it is at Gatun. The reason is that Gatun is nearer to the sea, and as the hills have been carried to the sea by the river the heavy stuff has deposited first, and at Gatun you naturally get a finer and a denser material than you would get at Bohio.

Senator KITTREDGE. Answering my question directly, if you will, Is Bohio just as favorable a site upon which to establish a dam for a lock canal as Gatun?

Mr. BATES. I think so, for practical purposes; yes, sir.

Senator HOPKINS. But, getting back to the point, you say at Gatun the soil is more dense and resists the seepage of water more than it would at Bohio?

Mr. BATES. I think so. That would simply mean that you would not need to have as great a distance between your rock fills, relatively.

Senator HOPKINS. Now, I wish you would explain that. The reason I am asking you this question is that there is some contention by some people who have examined those two sites to the effect that the character of the soil there at Gatun is such that you can not place a dam there that will stand; that the seepage of water is such that it will gradually destroy the effect of a dam at that point.

Mr. BATES. In answering that, may I use a practical illustration?

Senator HOPKINS. Anything that you wish.

Mr. BATES. On the Elbe-Trave Canal—you know northern Germany is a sand country—there was a section of canal there right through the sand plain, and everyone thought that a canal carried between embankments there could not be operated; that the sand would let the water all out. That did not turn out to be the case. What happened was that all the voids between the grains of sand filled with the fine silt that dropped after the water was turned into the canal.

Now, if at Bohio you have a coarser formation, then I would make the water travel a greater distance than it would have to if the material was more dense. That becomes a matter of engineering judgment; and if you find that there is more percolation than you would like you can always widen the dam.

Senator HOPKINS. If there is percolation there, you think there is no trouble in stopping it, if you make investigations so as to know the character of that percolation?

Mr. BATES. Yes.

Senator HOPKINS. And its extent?

Mr. BATES. Yes; but with this reservation—that in that tropical, earthquake country I would not subject that formation to a head of over 40 feet anywhere.

Senator HOPKINS. Yes.

Senator MORGAN. Why?

Mr. BATES. Because I think that you are coming to the point of balance where, if your dam should, by any reason, fail from an earthquake, you would have the greatest possible difficulty in putting it back. I have tried to make plain in my statement that it is very expensive to put back great dams by train service; but if you can put them back by dredge service it can be done with reasonable economy and quickly.

The limit that I have been able to put material with a dredge was probably at Portland, Oreg., where I made a damlike embankment about 32 or 33 feet high, and the greatest distance from the river was 2,800 feet. I have always felt that in that case I got to the limit of what I could do with this tool for doing this class of work which I had myself evolved.

Senator MORGAN. A dam 80 feet high, if it was broad enough, would resist the pressure quite as well as or better than one 40 feet high but not quite so broad, would it not?

Mr. BATES. It is not a question, sir, of resisting the pressure that makes these great widths for these dams. It is to limit the amount of percolation that you make it wide. If you have a head of 40 feet and a head of 80 feet you do not, with the smaller head, have to have your dam but half as wide, sir; and you find that illustration, sir, right here.

I had considered that in order to get the full lockage supply of the dams with a two-lock canal, one must have a dam and lock at either Mindi or Gatun, and at no other places. If, then, you have a four-lock canal, you must have it at Mindi and Gatun, and there are no other places; otherwise you will have the locks in flight, which I do not believe in.

You will see here a dam at Gatun exactly on the same axis as it is in the project of the minority here. On this side we have 62 feet, we will say, of water. On that side [indicating] we have 33; so that the net head is but 29 feet. When you have 29 feet you do not need to have so wide a dam. The result of having that head of 29 feet is

that in this dam, for the same amount of percolation, using the same formula, I have 4,500,000 yards, while in this dam you have 21,000,000. That is the difference.

Following up the question of the dams, we have here at Mindi—

Senator HOPKINS. Does that dam of yours stop all percolation?

Mr. BATES. With just the same formula as that one exactly.

Senator HOPKINS. Just leave that other one out. What is your judgment of yours?

Mr. BATES. My judgment of this is that it is perfectly safe, and that I could put it in easily, and I will show you why.

With mine I will put my first dam at Mindi. Then, when I am making this basin here I can pump my material direct, because it is within the power of my dredge to do it. I have the rock, plenty of rock, in Culebra, and this country from Jaramillo Hill to that point is full of these little hillocks. You see them here [indicating]. There are nine of them that come up above the top of the dam in that little distance there of about 3,000 feet. And so it is the simplest thing in the world. I could put in that dam in six months.

In the same way, the dam across the Chagres, in here at the mouth of the Indio—Mr. Maltby, in making the survey that the advisory board desired, found that it was about 3,000 feet across; less than 3,000 feet, his report says. No borings were ever made there; none have ever been made below Gatun in that distance, which is some 4 miles. No one knows whether that geologic gorge runs down there or whether it is a later uplift. But in any event the material deposited there must be of the same character as it is at Gatun, only finer.

When you come to the dry dock at Mindi—

Senator HOPKINS. When you say that "it must be of the same character, only finer," give us your reasons for making that statement.

Mr. BATES. Because the water first deposits the coarse material, and then finer, finer, finer, toward the sea.

Senator HOPKINS. Toward the sea?

Mr. BATES. Yes, sir.

Senator HOPKINS. What is the character of the material that you find at Gatun, and to what depths have you gone down?

Mr. BATES. We have the official profiles, which show—here is Gatun Hill, where the railway station is; there is a gorge which comes down across this way, in which the maximum depth recorded is 208 feet.

Senator HOPKINS. Two hundred and eight feet?

Mr. BATES. Two hundred and eight feet. On this side of the island they find another gorge which is 258 feet deep. My belief is that at Mindi there is no such gorge, and that you will find the rock all the way across there, probably about 60 feet and probably even closer to the surface.

Senator HOPKINS. Then, at Gatun you would have to go down 208 feet on one side and 258 on the other? Is that right?

Mr. BATES. No. In making this Morrison type of dam you first clear off the ground, taking off by dredges any of the very soft stuff that may be there. Then you get in your rock fill, and you fill in between with your earth fill, or, if you please, you first put in your puddle and your sheet piling, as they did at Assuit, in Egypt.

Senator HOPKINS. How far down do you go before you go to doing that—200 feet or 208 feet?

Mr. BATES. No; you probably would not go down; you would clear off perhaps the upper 10 or 15 or 20 feet, just according to the class of material you encountered.

Senator HOPKINS. Why would you not go down the 208 feet at one point and 258 feet at the other? Why would you not do that? That is what I want to get at; I want to learn.

Mr. BATES. Because you could not, Senator.

Senator HOPKINS. Now, if you could not go there——

Senator KITTREDGE. Why not?

Senator HOPKINS. Just let me finish, please.

Senator KITTREDGE. I beg your pardon.

Senator HOPKINS. You say you could not go there; but if you could not, why would you build on that location?

Mr. BATES. Because I am using a type of dam which does not need to go down there.

Senator HOPKINS. That is what I want to get at. Now, explain why it does not need to go down there.

Mr. BATES. We find that with a certain head of water you have a certain amount of percolation, according to the distance between the water on one side of the dam and the water on the other side of the dam; and when you have applied that it gives you the dimensions of your dam. People are a little in disagreement as to just the coefficients and other things to use in that formula; but substantially the right thing to do is to put enough there and enough width so that there will be a minimum of percolation and not more than you can admit.

Senator HOPKINS. Yes.

Mr. BATES. Now, then, applying the sum of human knowledge and experience on that subject, it results in a certain formula known as the Hazen formula, and that gives you the distance between the water on one side of the dam and the water on the other side of the dam; and when you have applied that it gives you the dimensions of your dam. People are a little in disagreement as to just the coefficients and other things to use in that formula; but substantially the right thing to do is to put enough there and enough width so that there will be a minimum of percolation and not more than you can admit.

Senator HOPKINS. Where does this percolation take place; at the top, or does it take place all the way down, 208 feet at one point and 258 at the other?

Mr. BATES. At Gatun it would not come through the dam, because that would be so thoroughly puddled that it would not come through the dam part at all.

Senator HOPKINS. Yes.

Mr. BATES. We do not know whether there are pockets of sand or porous material sufficiently well by any borings that may be taken to say whether any water, practically, would come through the first 100 or 150 feet. All the borings, practically, indicate that there would be very little, if any, percolation until you get down to where the coarser material is encountered in the bottom of the gorge. The consequence is that the water in getting to this side has to go down a certain depth, perhaps 50, 60, or 100 feet, perhaps even 200 feet, and then under the dam, and come up through that blanket on the other side; and I do not think it would come up. I think a certain amount might come; and the more head there is the more will come. There is the more danger of its coming.

Senator KITTREDGE. What about a dam 135 feet in height, speaking directly of the minority plan? What will happen in that event?

Mr. BATES. In the type of dam that Mr. Morrison advocated you would not make it as high as 135 feet. The minority have built a dam

of this shape, you see; it is 100 feet wide on top, and that summit is at 135 feet above the sea. The lake on this side is 85 feet above, so that you have 50 feet of height in here, as they say, of material taken from Culebra and hoisted up to this height, right on the front of the dam. In my judgment it does not add anything to the water tightness, because if it is tight already and thoroughly puddled you can not make it at all any tighter by any weight you put on it; but I should imagine that if you carried such an overloading to extremity—if, for instance, that was all lead, for an illustration—then you might get so great a weight on this portion that there would be subsidence here and uplift there [indicating].

Senator KITTREDGE. When you say "here" and "there," kindly indicate by language where "here" and "there" means.

Mr. BATES. Yes; there would be subsidence in the crest of the dam and uplift on either side of the dam.

Senator HOPKINS. You mean the water would rise up? Is that what you mean?

Mr. BATES. Yes, sir. To give a practical illustration: In passing Lake Colville, on the Northern Pacific, we had a lake shaped like my hand, and ran across a little arm which was apparently solid ground. When we put in material by trains, it constantly went out and we did not know where it went to. But after we had been working there several months there came up an island about 1,000 feet out in the lake; and the trains to-day run across that place on a "U," unless they have changed the line since I knew it—that is, the train is here and the island is there, and they are in equilibrium.

So that if you overload the crest of the dam you do not, I believe, increase the water-tightness, but you increase the possibility of subsidence or of slide.

Senator KITTREDGE. Then what would happen?

Mr. BATES. If it slid, your dam would go out.

Senator KITTREDGE. To what extent would the sliding occur before the dam would go out?

Mr. BATES. Just as soon as your water overtook it, you could not stop it. Then it would carry the earth and the rock and everything away.

I have seen the Mississippi scour away its bed 100 feet below its normal bed when it got started in a certain direction. When I was building the Puyallup Dam (which I have right here), it was the first dam, as I said, ever built by the hydraulic process in the world. We had there a tide of 18 feet, and the length of the dam was 900 feet. I put my dredge above the dam, where I could borrow the material and pump direct, and undertook to close it at the slack of the tide at high tide. The first time that I tried it I could not get it high enough during that tide, starting at the low tide and following it up to the high tide, to keep the water from overtopping, and it overtopped it and in five minutes it had a crevasse there 100 feet wide and 60 feet deep. I was standing on the dam at the time it happened and had to run for my life. So that when a dam breaks it goes almost instantaneously, and if there should be a fissure or break here the water would come through and it would scour.

Senator HOPKINS. You mean a break at the crest of the dam?

Mr. BATES. Yes; from fissure or subsidence. The water would come through—

Senator HOPKINS. What do you mean by subsidence?

Mr. BATES. Like a landslide on a railroad bank. Suppose a section right in here should go out by going down.

Senator HOPKINS. That is, suppose the section of the top of the dam should go out?

Mr. BATES. Yes; go down. For instance, it is now at a slope of 3 to 1.

Senator HOPKINS. Yes.

Mr. BATES. Suppose your strains are such as to change that slope to 10 feet—then it is just like sitting down.

Senator HOPKINS. And the water will rush in over the top?

Mr. BATES. And carry it right away.

Senator HOPKINS. Yes.

Mr. BATES. Now, then, it would scour not only the dam away, but, in my experience, I believe that at 85 feet head—and I had at Puyallup only 18—I believe that it would scour 150 feet deep.

Senator HOPKINS. The point I am getting at is this: That if the dam would go out, it would go from an overflow rather than an underflow of water?

Mr. BATES. Absolutely; yes, sir. I think there is not the least danger of an underflow.

Senator HOPKINS. Yes; that is the point I wanted to get at.

Mr. BATES. Especially if you keep your head low; and if you make your head high, and a dam of that character should go out, you can not put it back with mechanical means. It can only go back by trains, and that means years.

Senator HOPKINS. But there is no danger of your dam, or any dam that may be put there, being carried out by an underflow of water?

Mr. BATES. I do not think so.

Senator KITTREDGE. What is the height of your dam at Gatun?

Mr. BATES. The height of the crest is 75 feet. I have not overloaded it.

Senator KITTREDGE. Above what?

Mr. BATES. Above sea level. It is a matter of judgment.

Senator KITTREDGE. Sustaining what head of water?

Mr. BATES. A net head of 29 feet.

Senator KITTREDGE. How much more head of water, in your judgment, is it safe for any dam to be planned to sustain at that point?

Mr. BATES. I would not sustain over 40 feet.

Senator KITTREDGE. Why?

Mr. BATES. Because it takes so very much material to put it in, making it an expensive dam, because it would be so very expensive and long to repair if it ever broke away.

Senator KITTREDGE. You say, "if it ever broke away;" do you not expect to put a dam in there, if we adopt the lock plan, that will stay there forever, for all time?

Mr. BATES. It will, except in earthquake.

Senator KITTREDGE. Why do you think there is any danger in that regard, then?

Mr. BATES. I understand that to be an earthquake country, and it is quite possible that something of that sort may occur.

Senator KITTREDGE. Would not a general earthquake destroy any kind of a canal?

Mr. BATES. Yes; practically.

The CHAIRMAN. Any canal of any kind?

Mr. BATES. Any canal. All the canals are vulnerable in that respect—the sea-level canal just as much so as the lock canal. In fact, I consider the sea-level more so, because that Gamboa dam has such tremendous heads. Your danger from earthquake diminishes as your head of water increases.

Senator MORGAN. Mr. Bates, as to the dam of the minority report there. Is that lock on the east or the west side of that dam?

Mr. BATES. This is the east side, sir.

Senator MORGAN. The east side?

Mr. BATES. Yes, sir.

Senator MORGAN. Is your lock on the east or the west side?

Mr. BATES. On the same side.

Senator MORGAN. They are both on the same side?

Mr. BATES. Yes, sir.

Senator MORGAN. And on the same hill?

Mr. BATES. The same hill.

Senator MORGAN. The axis of your dam is the same as the axis of the dam proposed by the minority?

Mr. BATES. Yes, sir.

Senator MORGAN. Across the Chagres?

Mr. BATES. Yes, sir; only that the minority's dam is higher; consequently it is longer.

Senator MORGAN. Your dam is 75 feet high?

Mr. BATES. About; yes, sir.

Senator MORGAN. And the other one is how high?

Mr. BATES. One hundred and thirty-five feet.

Senator MORGAN. One hundred and thirty-five feet. Your dam is practically half as high as theirs?

Mr. BATES. A little more than half as high.

Senator MORGAN. And you raise the water how far—29 feet?

Mr. BATES. Twenty-nine feet.

Senator MORGAN. How high do they raise it?

Mr. BATES. Eighty-five feet.

Senator MORGAN. Then the choice between the two dams, taking them by themselves, in your opinion, depends upon the heights?

Mr. BATES. It depends upon the head—the head of water which they are sustaining.

Senator MORGAN. That means the height of the dam that backs the head of water?

Mr. BATES. The dam of the minority has 85 feet on one side and no feet on the other. The dam that I put at Gatun has 62 feet on one side and 35 on the other, making a net difference of 29 feet. Consequently my dam has to combat the pressure and the percolation due to a head of 29 feet instead of 85—about a third.

Senator MORGAN. Now, then, your estimate of the difference in volume between your dam and the dam proposed by the minority, as I understand it, depends upon the height of the dam? They have theirs too high, in your judgment?

Mr. BATES. In order to put in a flight of three locks they have made it high. I had to put in but one lock, and had no occasion to make it so high.

Senator MORGAN. Very good. Now, because you had no occasion to make it so high, and they had an occasion to make it so much higher, you think that your plan is a safer plan than the dam 85 feet high?

Mr. BATES. Surely.

Senator MORGAN. Yes; and that is your choice between the two dams principally?

Mr. BATES. Surely; yes, sir.

Senator MORGAN. You put a revetment of stone around your dam?

Mr. BATES. Yes.

Senator MORGAN. Or riprap, or cement, or whatever you please?

Mr. BATES. Stone. The minority make one around the foot, and they riprap the front of their dam. The essential principles of the construction of the dams are the same.

Senator MORGAN. Then I understand that there is no danger, in your opinion, of the water underwashing your dam?

Mr. BATES. I do not think so.

Senator MORGAN. And quite as little of its underwashing the dam of the minority report?

Mr. BATES. Quite as little, but more likely, inasmuch as you have 85 feet head as against 29.

Senator MORGAN. Very good; but take them together; they would be practically of equal solidity, would they not?

Mr. BATES. Yes, sir.

Senator MORGAN. And of course, therefore, practically equally capable of resisting the head of water?

Mr. BATES. As far as resistance goes; yes.

Senator MORGAN. One might not resist a head of water 85 feet high, and the other one might resist one that was lower—the height of your dam?

Mr. BATES. Using the same formula of construction.

Senator HOPKINS. One moment. From the answer to that question I do not know whether I understood him aright on my question. I understood you to say, Mr. Bates, on the construction of the minority dam or on the construction of your dam that there was no danger from an underflow.

Mr. BATES. Yes, sir.

Senator HOPKINS. That is correct, is it?

Mr. BATES. I think so.

Senator HOPKINS. That if either dam gives way, it would give way from an overflow?

Mr. BATES. From an overflow or fissure.

Senator HOPKINS. Yes; or a fissure caused by an earthquake?

Mr. BATES. Certainly.

Senator HOPKINS. Under no other conditions would there be any trouble with either type of dam?

Mr. BATES. I do not think there would.

Senator HOPKINS. Yes; that is what I wanted to know.

Senator MORGAN. So that there is practically no difference except one of the method of construction between the solidity, I will say, of your dam and the solidity of the dam of the minority?

Mr. BATES. Very little.

Senator MORGAN. But in case a fracture or a fissure should occur, your dam would be easier to replace than the other?

Mr. BATES. Very much.

Senator MORGAN. And would not have the same force in scouring the material away that had hitherto been put there?

Mr. BATES. No, sir; because the head is lower.

Senator MORGAN. Then that brings it to this proposition, if I understand it—that both dams would stand unless a fissure occurred?

Mr. BATES. Yes, sir.

Senator MORGAN. And then the question would be which would be the most disastrous in its effects and which would require the greatest expense to replace it?

Mr. BATES. Yes, sir.

Senator MORGAN. And that is the whole story?

Mr. BATES. That is the whole story.

Senator MORGAN. Do you consider your dam perfectly safe?

Mr. BATES. Yes, sir.

Senator MORGAN. And you consider the other one equally safe except for the danger of a fissure?

Mr. BATES. Except for the danger of a fissure or overflow, and the difficulty of putting it back if anything ever happens to it. It is going to be hard enough to put it there and much harder to ever put it back.

Senator MORGAN. Well, if it should ever happen I reckon we would have to put back the Island of Martinique and some other islands in the Caribbean Sea. [Laughter.] I believe I understand your propositions now, as far as I am concerned.

Senator DRYDEN. I want to ask Mr. Bates about the east and west breakwater that he speaks of on page 1624. I would just like to have you point those out and explain a little about them, Mr. Bates. You seem to think that that is rather a dangerous situation there.

Mr. BATES. If you will permit me, Senator, I will get the drawings of those.

Senator MORGAN. While you are getting ready to answer that question I want to ask one question. You mentioned the dam at Bohio, and said you thought it was entirely practicable to put a dam in there. In the dam that you would put in at Bohio, would you put in a rock foundation of any kind?

Mr. BATES. No, sir; I would use the same type of dam.

Senator MORGAN. Well, you have a rock foundation of your dam here, have you not?

Mr. BATES. Oh, you would put your dam between rock fills just the same.

Senator MORGAN. Would these rocks go down to solid rock, or would they rest upon the surface of the material?

Mr. BATES. They rest upon the surface, or within 20 feet of the surface. You first strip the dam site and then put your rock on it.

Senator MORGAN. Very good. Now, there is no such provision made in the dam of the minority?

Mr. BATES. Oh, I think so, sir; yes; I think so. They first strip the ground. They put rock at the toe of their slope 200 feet wide, and I understand they put riprap at the front of their dam. It does not appear to me that they put the volume of stone in the front of their dam which Mr. Morrison has advocated and which I have shown; but, on the other hand, there is no reason why they should not do it if they want to.

Senator MORGAN. Now about the rock that either of you would use—you, in the construction of the Bohio dam (which follows Mr. Morrison's idea), and in the construction of the dam of the minority report—in all of these cases the rock is put around there as a retaining wall within which to pack the earth?

Mr. BATES. Yes, sir.

Senator MORGAN. And not as a protection against the weight of the water that comes from above?

Mr. BATES. Oh, it acts in both capacities.

Senator MORGAN. It acts in both capacities? There is that much more weight added to the dam, and that is the reason I ask it.

Mr. BATES. Yes, sir.

Senator MORGAN. But in neither case is it because of the fact that the riprap is put in there or whatever kind of rock revetment you put around the dam—in neither case is it because it rests upon a rock foundation?

Mr. BATES. In neither case.

Senator MORGAN. That is all I wanted to ask.

Senator HOPKINS. I want to ask you one or two questions, Mr. Bates. In your testimony that has been printed you say (you did not state it orally here the other day): "The writer did not reckon upon buying steamships for nearly 50 per cent more than their value." What did you mean by that?

Senator DRYDEN. Mr. Bates covered that earlier.

Senator TALIAFERRO. I do not think he covered it fully.

Senator HOPKINS. If he did, I did not hear it.

Senator DRYDEN. All right.

Senator HOPKINS. What do you mean by that?

Mr. BATES. I have already explained—

Senator HOPKINS. Well, just leave that out, and explain it to me. I did not hear any of it.

Mr. BATES. The cost of those ships was \$610,000 each.

Senator HOPKINS. Of what ships?

Mr. BATES. The *Mexico* and *Havana*.

Senator HOPKINS. It was what?

Mr. BATES. It was \$610,000.

Senator HOPKINS. How do you know that?

Mr. BATES. I was informed by a gentleman who is in the business.

Senator HOPKINS. By whom?

Mr. BATES. I have already named him—Mr. Langell.

Senator HOPKINS. How did he know the value of them; or what they cost?

Mr. BATES. He was familiar with making up the estimates on which bids were made; and, as I have said, he informed me that one company bid \$550,000 for those ships, and the Cramps \$610,000; and because of the relations of the Ward Line to the Cramps, the Cramps took the contract at \$610,000. These vessels were five or six years old—

Senator HOPKINS. Before you get through with this, right at that point, let me ask you this: Who is this man you speak of?

Mr. BATES. At present he is the man connected with the New York Shipbuilding Company whose business it is to make up the estimates upon which bids are made.

Senator HOPKINS. Is he living in New York now?

Mr. BATES. No; he lives at Camden, where these works are.

Senator HOPKINS. That is all you know about the matter of paying 50 per cent more, is it?

Mr. BATES. The way I got at it was this: The P. & O. Steamship Company, the great English steamship company with which I am familiar, and other companies write off 7 per cent per annum from the value of a ship. Applying that principle to the *Harana* and the *Merico*, I consider that those vessels were really worth, from depreciation, about from \$425,000 to \$450,000 apiece.

Senator HOPKINS. Do you know anything about the condition of the ships from the time that they were first launched up to the time that they were purchased, personally?

Mr. BATES. I do not, personally; no.

Senator HOPKINS. Do you know anything about the condition in which they were kept from year to year?

Mr. BATES. I assume that they were kept as well as vessels can be kept.

Senator HOPKINS. Do you know? I do not want any assumptions. I want to know if you know anything about it?

Mr. BATES. No, sir.

Senator HOPKINS. Do you know what condition the ships were in at the time they were purchased?

Mr. BATES. I know nothing about the condition of the ships.

Senator HOPKINS. Have you ever seen them?

Mr. BATES. No.

Senator HOPKINS. Then the judgment which you have expressed here in this pamphlet before me was founded upon the statement made by this gentleman in New Jersey?

Mr. BATES. Yes, sir.

Senator HOPKINS. And the fact that they charge off 7 per cent per annum for the use of a vessel?

Mr. BATES. Not only that, but from the knowledge of the sizes of these vessels, and from the fact that I have built and owned vessels myself, and I am accustomed to figuring on that class of work.

Senator HOPKINS. Do you know whether these vessels had depreciated any in their value at the time that they were purchased from what they were at the time they were first launched?

Mr. BATES. Every vessel does, sir.

Senator HOPKINS. But do you know anything about these vessels?

Mr. BATES. I simply apply to them the broad principle that every vessel depreciates from the day it leaves the stocks.

Senator HOPKINS. Is it not a fact that vessels can be kept in good condition by repairs so that a vessel twenty years from now can pass "A 1"—a vessel 20 years old?

Mr. BATES. The *Aurania*—

Senator HOPKINS. No; answer my question. Is not that a fact?

Mr. BATES. No, sir; it is not a fact.

Senator HOPKINS. Is it not a fact that vessels are kept in such repair that they pass with insurance companies A 1 when they are twenty years of age?

Mr. BATES. It is one thing to pass with insurance companies and another thing to have a selling value.

Senator HOPKINS. On the question of a selling value, do you say that a vessel that is 20 years of age has never been passed as A 1?

Mr. BATES. I say that a vessel that is 20 years of age is not worth what she was when she was built, and nobody can make her so, unless there come extraordinary circumstances.

Senator HOPKINS. What do you mean by "extraordinary circumstances?"

Mr. BATES. A war.

Senator HOPKINS. Well——

Mr. BATES. You give your "kingdom for a horse."

Senator HOPKINS. You mean unless there is a greater demand than there ordinarily is for a vessel?

Mr. BATES. Yes, sir.

Senator HOPKINS. What do you know about the steam dredges that were used there that you say have depreciated, say, 50 per cent?

Mr. BATES. You must not misunderstand it in that fashion, Senator.

Senator HOPKINS. The 50 per cent does not apply to steam dredges?

Mr. BATES. Only to the ships, sir.

Senator HOPKINS. What do you know about their paying more for steam dredges than they were worth?

Mr. BATES. My objection in that clause—what I mean to say is that I would not buy dredges until I knew what I was going to do.

Senator HOPKINS. Do you know whether any exorbitant price was paid for any dredges?

Mr. BATES. No; I do not think there was.

Senator HOPKINS. Was any exorbitant price paid for any shovels that were purchased?

Mr. BATES. I do not think there was.

Senator HOPKINS. Or for any locomotives that were purchased?

Mr. BATES. I do not consider that point at all. What I have to say relates to the fact——

Senator HOPKINS. Now, wait a minute; I will get at that. But, so far as dredges, shovels, and locomotives were concerned, you have no information that would warrant your saying that the Government paid any more than those dredges, shovels, and locomotives were worth?

Mr. BATES. I have not said so.

Senator HOPKINS. Do you say so now?

Mr. BATES. I never have said that they paid any more for them than they are worth.

Senator HOPKINS. Then, your criticism is that they have purchased some before they needed them?

Mr. BATES. Before they knew what they were going to do.

Senator HOPKINS. That does not answer my question.

Mr. BATES. Before they needed them.

Senator HOPKINS. Now, take locomotives. What locomotive, or locomotives, have they purchased there that they did not need?

Mr. BATES. The first point, Senator, is this ——

Senator HOPKINS. No, no; take the locomotives first.

Mr. BATES. With the locomotives, the number ordered depended upon what they meant to do at Culebra. Now, then——

Senator HOPKINS. How many of them did they order?

Mr. BATES. You have it in the record—120.

Senator HOPKINS. One hundred and twenty?

Mr. BATES. One hundred and twenty have been ordered, as I recall, for the Commission, and 24 for the Panama Railroad.

Senator HOPKINS. Yes. Do you say that at the time that that order was given they did not need that many?

Mr. BATES. I say that they never studied the Culebra proposition to know whether they should use locomotives, steam traction, or electric traction, and that there was never any study by anybody competent to make it of the Culebra excavation; and it is altogether a question with me whether that is the best way to do it.

Senator HOPKINS. By locomotive, you mean? Have you ever heard any other engineer claim that they could use other than steam locomotives?

Mr. BATES. It is perfectly feasible to use electric traction.

Senator HOPKINS. Have you ever heard any other engineer, American or foreign, say that they could use other than a steam engine?

Mr. BATES. I discussed this matter, for instance, with Mr. Coffin, the president of the General Locomotive Company, and pointed out to him—

Senator HOPKINS. We have your view; but I ask you if you know of any other American engineer, or any foreign engineer, that has claimed that they could use other than steam engines there in the construction of the canal—I mean, economically?

Mr. BATES. Yes; for years people have had in mind the application of electricity to the Panama and the Nicaragua canals.

Senator HOPKINS. And who has advocated the use of electricity over steam for the construction of this canal, in the operation and use of locomotives?

Mr. BATES. I do not recall at the moment anyone who has; but, on the other hand, there are people who have. I will look it up for you and give you the data.

Senator HOPKINS. Do you know how many dredges were ordered?

Mr. BATES. Yes. There have been two dipper dredges ordered—one for Colon and the other for La Boca—at a price of about \$100,000 each.

Senator HOPKINS. Are those dredges now in use?

Mr. BATES. No, sir; they are not yet delivered.

Senator MORGAN. Not yet delivered?

Mr. BATES. No, sir. Parties have gone down there to assemble them.

Senator HOPKINS. How many shovels? Do you know anything about those that have been ordered?

Mr. BATES. Some 62 shovels, I think.

Senator HOPKINS. Do you know whether those that have been ordered are in use at all?

Mr. BATES. I think the total order is about 100. There are 17 in use. An engineer who came to my office just two days ago told me there were 17 in use when he left the Isthmus, about ten days ago.

Senator HOPKINS. How many have been delivered; any more than 17?

Mr. BATES. I do not know.

Senator HOPKINS. Now, to get back to these two ships, do you know anything about the conditions under which they were purchased?

Mr. BATES. No; no.

Senator HOPKINS. You do not know anything at all about the circumstances under which they were purchased?

Mr. BATES. No, sir.

Senator HOPKINS. Do you know anything about the demand in transportation for vessels of the type of these two ships?

Mr. BATES. I can easily imagine that there was a very large demand, because there was a tremendous amount of stuff bought for the Isthmus—free material.

Senator HOPKINS. I am not speaking of the demand for the Isthmus.

Mr. BATES (continuing). Which made the demand.

Senator HOPKINS. I ask you the question, do you know anything about the demand for vessels of this type in the transportation business at the time these ships were bought?

Mr. BATES. I know that there was a fair demand for vessels of that character, and that these two vessels were on the Mexican line.

Senator HOPKINS. Do you know whether any vessels of this type, and of the quality, character, and condition of these vessels, could have been bought anywhere in the world cheaper than these were bought at the time that they were purchased?

Mr. BATES. They could have been built, brand new—

Senator HOPKINS. No; wait a moment. Answer my question, please.

Mr. BATES. I do not know of any vessels that could have been bought for that price or any other price.

Senator HOPKINS. You do not know of any that were for sale then?

Mr. BATES. I am not cognizant of that.

Senator HOPKINS. Do you know how many vessels of that type were actually in existence in the commercial world?

Mr. BATES. I suppose there were just two; these being sister ships, there were just two vessels like that.

Senator HOPKINS. Of that type, and that—

Mr. BATES. If you mean by size; but of that type—of course, you know, all vessels differ; so that if you mean those identical dimensions, if you make a specification that fits only those vessels, those were the only vessels that could be had.

Senator HOPKINS. Take vessels that could be utilized for the purposes to which these were put—how many were in existence in the commercial world?

Mr. BATES. I will look that up.

Senator HOPKINS. You do not know, do you?

Mr. BATES. No.

Senator HOPKINS. Then, you have no knowledge of your own from which you could say whether the Government paid too much for those vessels or not?

Mr. BATES. I judged that it paid too much, because a new vessel could be built for the price that it paid.

Senator HOPKINS. How long would it take to construct a new vessel of that type?

Mr. BATES. About eight or nine months—say ten months.

Senator HOPKINS. Where could such a vessel as that be built within ten months—at what shipyard?

Mr. BATES. The New York Shipbuilding Company.

Senator HOPKINS. The New York Shipbuilding Company?

Mr. BATES. Yes, sir.

Senator HOPKINS. Within ten months from the time the order was given?

Mr. BATES. Yes, sir, very probably; I think so. I am very certain it could have been built in that time at the Armstrongs', for instance.

Senator HOPKINS. That is all.

Senator TALIAFERRO. I suppose, Mr. Bates, that you mean by that statement that in the purchase of a large quantity of tools down there on the Isthmus, before the type of canal was decided upon, the Commission has acted indiscreetly.

Mr. BATES. I think so.

Senator TALIAFERRO. That was the point?

Mr. BATES. That was the point I wished to bring out—the type should be decided first.

Senator TALIAFERRO. And as a matter of fact, where they paid \$1,300,000 for two ships 10 years old, duplicates of those ships could have been built and delivered new for that amount of money?

Mr. BATES. Yes, sir.

Senator TALIAFERRO. That is the point?

Mr. BATES. That is the practical point; yes, sir.

Senator MORGAN. Mr. Bates, if you are through with that matter, I will ask you a question. A sea-level canal constructed in from the bay of Limon would remain at sea level, if I understand the situation out there, practically until it reached Bohio, without any very deep embankments—perhaps without any?

Mr. BATES. Yes, sir; the elevation at Gatun of the surface of the swamp is about 4 or 5 feet above sea level.

Senator MORGAN. Yes.

Mr. BATES. And that level runs practically to Bohio, and the lowest recorded water of the Chagres at Bohio is just mean sea level.

Senator MORGAN. That would leave the banks of the canal how high above the surface of it at Bohio?

Mr. BATES. The natural bank just below Bohio would perhaps be 6 or 8 feet.

Senator MORGAN. Six or eight?

Mr. BATES. Yes.

Senator MORGAN. Now, continue that sea level on up to Gamboa; how high would the banks of the canal be above the sea level and above the surface of the canal at, say, Gamboa, taking the river there as the central point?

Mr. BATES. At Gamboa the elevation of the river is 45 feet above sea level. The bank is higher than that—about 5 feet. But these measurements that I give are the heights of the natural conformation and not the height of the spoil banks adjacent.

Senator MORGAN. I understand that. I am taking the natural surface as the indication of the height. It is about 50 feet, then, that the natural surface at Gamboa would be above the surface of the canal?

Mr. BATES. Yes.

Senator MORGAN. About 50 feet?

Mr. BATES. Yes.

Senator MORGAN. Is there good ground at Gamboa for putting in locks?

Mr. BATES. At Gamboa?

Senator MORGAN. Yes.

Mr. BATES. The French have a site at Obispo which was rock. That is across the Chagres from Gamboa, on the right bank of the Chagres going up—on the west bank of the Chagres.

Senator MORGAN. Yes.

Mr. BATES. That was a rock lock site adopted by the old company when they were obliged to abandon the sea-level scheme.

Senator MORGAN. That location for the locks is in a ridge that makes out toward Gigante; it is in a ridge there, is it not?

Mr. BATES. Oh, Gigante, sir, is right above Bohio.

Senator MORGAN. I know it is; I mean the direction of Gigante. It is a ridge that comes in there at Bohio, and the locks are to be located on the left bank of the Chagres River? I do not mean on the bank, but on the left side?

Mr. BATES. That is, the Bohio locks were to be on the left bank of the Chagres; yes.

Senator MORGAN. The left bank of the Chagres River?

Mr. BATES. Yes, sir.

Senator MORGAN. Very good. Then there is a ridge running out toward Gigante?

Mr. BATES. Yes, sir.

Senator MORGAN. From there?

Mr. BATES. Yes, sir.

Senator MORGAN. Now we will go up to Gamboa. Is there suitable and proper ground at Gamboa for putting in locks?

Mr. BATES. You could put in a lock at Obispo, but nobody, in the present project, is suggesting a lock at Gamboa.

Senator MORGAN. Well, suppose I suggest one?

Mr. BATES. Then you would have to put it at Obispo, where the old French location was.

Senator MORGAN. At Obispo, out beyond Gamboa, farther to the south than Gamboa?

Mr. BATES. There is Gamboa [indicating].

Senator MORGAN. Yes.

Mr. BATES. There is Gamboa here. Now, the Obispo lock was located in here somewhere.

Senator MORGAN. At Gamboa is there any ground suitable for putting in locks?

Mr. BATES. I do not think so; because you could put a lock going with the Chagres, but that would not take you to Panama. On the other side you have not very good ground for a lock unless you cut into the side of this hill or into the side of that hill [indicating]. You can put it right above Gamboa there, right at the beginning of the Culebra section.

Senator MORGAN. Yes; that is good ground for locks, is it?

Mr. BATES. Oh, yes.

Senator MORGAN. What would be the depth of the water at that place, at Obispo, below the surface of the earth—the level of the water?

Mr. BATES. The level of a sea-level canal?

Senator MORGAN. Yes.

Mr. BATES. It would be 45 feet at Gamboa.

Senator MORGAN. How at Obispo?

Mr. BATES. Practically the same.

Senator MORGAN. Practically the same?

Mr. BATES. Yes, sir.

Senator MORGAN. So if you were running a sea-level canal to Obispo

you would have, when you got there, a natural bank on either side of about 40 feet elevation above the surface of the canal?

Mr. BATES. From 45 to 50 feet.

Senator MORGAN. And that would be a suitable and safe location for putting in locks?

Mr. BATES. It would be a safe location; it would not be a suitable one.

Senator MORGAN. Why not suitable?

Mr. BATES. Because then you would have to feed your summit level entirely from storage in a lake above Gamboa or Alhajuela, and there is not water enough then for a lock canal at all.

Senator MORGAN. Not water enough in the Chagres River?

Mr. BATES. Above Gamboa—no, sir.

Senator MORGAN. Above Gamboa?

Mr. BATES. No, sir.

Senator MORGAN. No matter what dam you put in there you could not get water enough to feed that canal?

Mr. BATES. You could not.

Senator MORGAN. The sea-level canal that would run from the bay of Limon to Obispo would have its water furnished from the sea?

Mr. BATES. Yes.

Senator MORGAN. Would it require any great amount of water in addition to that in order to keep the canal in operation between Obispo with a sea-level canal in operation between Obispo and the bay of Limon?

Mr. BATES. Why, you have the ocean; the ocean is your inexhaustible reservoir for a sea-level canal.

Senator MORGAN. That is what I supposed.

Mr. BATES. Yes, sir.

Senator MORGAN. So that you would have to borrow no water from the Chagres at all in order to run that end of it out. How many miles would that be from Obispo to the bay of Limon?

Mr. BATES. It is 45 kilometers—that is, 31 miles—30½ miles.

Senator MORGAN. Thirty and one-half miles of sea-level canal, reaching from the Bay of Limon to Obispo, would be filled with sea water?

Mr. BATES. Yes.

Senator MORGAN. Would there not be enough water left in the Chagres River, with a dam across at Gamboa, to supply a lock level out to the other end?

Mr. BATES. No, sir; because you would only have the water that falls in the Chagres watershed above Gamboa; and that is only about half of the total water supply of the Isthmus, and I think that it takes all the water supply of the Isthmus to supply a lock canal, no matter of what description, and the amount of water that you use is determined by your upper lock. If, for instance, you have a summit level at 60 feet, the water that supplies your summit level also will supply your lower level; so that if you put a lock at Obispo you would have only the water supply above Gamboa. If you put your lock at Gatun you would have double the amount of lockage supply.

Senator MORGAN. What is the height of the dam the minority propose at Gamboa?

Mr. BATES. The minority do not propose any dam at Gamboa.

Senator MORGAN. Oh, yes. What is the height of the dam that has been heretofore proposed at Gamboa to back the Chagres River up, say, to Alhajuela? What would be the height of the dam requisite?

Mr. BATES. The sea-level scheme proposes a dam whose crest is 180 feet above sea level, and in which the head of water may mount to 170 feet.

Senator MORGAN. That is for controlling works?

Mr. BATES. Yes, sir.

Senator MORGAN. And water power?

Mr. BATES. Yes; if anybody could use it.

Senator MORGAN. What is the area of that lake above the dam proposed by the sea-level report, in square miles?

Mr. BATES. I think it is stated to be about 37 square miles; but I would have to look that data up.

Senator MORGAN. You would have to look it up?

Mr. BATES. Yes, sir; I think it is 37 square miles.

Senator MORGAN. And you think that a lake of that size would not be sufficient to supply a lock canal between Obispo and, say, Miraflores?

Mr. BATES. That lake must be fed by the run-off of the watershed, so that if that run-off is, for instance, 4,000 cubic feet per second, then the 4,000 cubic feet per second is all you have to use, no matter whether your lake is as big as Lake Superior.

Senator MORGAN. What is the approximate distance between Obispo and Miraflores?

Mr. BATES. Ten miles. Obispo is 31 miles and Miraflores 41—just 10 miles.

Senator MORGAN. Ten miles. Now, do you think that the supply of water from the Chagres River would not fill the prism of the canal between Obispo and Miraflores?

Mr. BATES. I think that it would fill it, but it would not be enough to lock 50,000,000 tons per annum through that section.

Senator MORGAN. You think you would require more water than the Chagres River would afford for that purpose?

Mr. BATES. Than that portion of the Chagres would afford.

Senator MORGAN. Yes; I am talking about the reservoir as far down as Gamboa.

Mr. BATES. No, sir.

Senator MORGAN. There are still other affluents that come in there—the Obispo and several other affluents that come in between Miraflores and Gamboa?

Mr. BATES. They are very small; comparatively small.

Senator MORGAN. Yes; comparatively small. Now, taking them all together, it is your opinion that that 10 miles of lock canal could not be sufficiently supplied with water for commercial purposes, for floating ships in the canal?

Mr. BATES. Yes, sir.

Senator MORGAN. With a dam 185 feet high, I believe it is, at Gamboa?

Mr. BATES. Yes, sir.

Senator MORGAN. That is what I wanted to ascertain.

Senator TALIAFERRO. Mr. Bates, what would you consider to be the ideal type of canal across that Isthmus, disregarding the question of cost and the question of the time necessary to construct it? What do

you regard, as an engineer, the ideal type of canal across that Isthmus? Is it a lock or is it a sea-level canal?

Mr. BATES. It is a lock canal; a lock canal with the locks not in flight, but single, separated from each other not less than 3 or 4 miles; with the summit lake beginning at Gatun, extending through to Pedro Miguel, at an elevation of not to exceed 62 feet above sea level; with a controlling dam at Gamboa and another at Alhajuela, so as to divide your risks, not having it all at Gamboa, as the majority propose; with your lower locks at Mindi and at Sosa Hill. With such a plan you will have the greatest amount of lake navigation, the most absolutely assured control of the Chagres; it is the easiest to construct, the most sanitary, and has all the advantages that I can think of for anything that can be done.

Senator HOPKINS. Do you, under any conditions, favor a sea-level canal, Mr. Bates?

Mr. BATES. No, sir.

Senator HOPKINS. Now, can you briefly state why you do not favor a sea-level canal?

Mr. BATES. I am discussing the report—

Senator TALIAFERRO. Now, Mr. Bates, if you will pardon me—

Mr. BATES. I have the heads here that I want to refer to.

Senator TALIAFERRO (continuing). Instead of criticising the plan that has been submitted here, if you would only answer from your own point of view as an engineer, it would be so much more satisfactory, I think, to the committee.

Mr. BATES. Yes, sir.

Senator HOPKINS. My question was propounded upon this idea: Some engineers claim that a sea-level canal is the true type of canal to construct there. Others say it is not. In answer to my question you say that under no conditions would you put a sea-level canal across the Isthmus.

Mr. BATES. Yes, sir.

Senator HOPKINS. Now, just in a few brief words, please make that plain to a layman.

Mr. BATES. One of the first things is the terminal harbors at each end. For the benefit of this country, I consider that the best harbors that can be made are combined salt-water and fresh-water harbors adjacent to each side.

Senator TALIAFERRO. Now, that suggestion does not go to the question of the canal, Mr. Bates, at all. I should consider that the harbors could be made just as useful with one type of canal there as with another; and what we wanted to ascertain was your objection to the sea level as a type of canal, not the question of intermixing sea water there with fresh water, as you would do with a lock canal.

Mr. BATES. Exclusive of the harbors, then, and the type of the sea-level canal, which would have only salt-water harbors, the first objection that I would recite with reference to the vessel is that she travels all the way in a constricted channel. That being so, her average speed will be less, and it will take longer to cross the Isthmus in a sea-level canal from the dispatching station on one side to the dispatching station on the other. I speak of large-sized ships.

Senator TALIAFERRO. Just for information, at what speed do you estimate it would be safe for a large-sized ship to traverse a sea-level canal, as recommended by a majority of the consulting board?

Mr. BATES. From 4 to 5 miles an hour.

Senator TALIAFERRO. And the length of the canal is what?

Mr. BATES. The distance is forty-five miles.

Senator MORGAN. In a sea-level canal?

Mr. BATES. Forty-five miles from the dispatching stations—44 miles from the dispatching station off Colon to the tide lock at Sosa Hill.

Senator MORGAN. You have to add 3 miles to that to go down to the islands, do you not?

Mr. BATES. Yes, sir; but your dispatching station really is your standard for isthmian transit.

Senator HOPKINS. Your first objection, as I understand it, is the restricted speed of the vessels in crossing the Isthmus. What other objection have you to the sea-level canal?

Mr. BATES. In making a regulation of the Chagres, you have in the sea-level proposition a dam at Gamboa 180 feet high, with a head up to 170 feet, and I regard that as a very high dam and a very high head. The amount of excavation in the Culebra cut runs it up to enormous cost. You have the most lower Chagres diversion work. In order to keep the water of the watershed out of the canal, the plan practically provides for diversions on both sides. On the east side it follows closely the valley of the Chagres, and finally debouches into the Bay of Manzanillo. On the west side, instead of making diversions adjacent to the canal, they have been cut out.

Senator HOPKINS. Who has cut them out?

Mr. BATES. The sea-level proposition—the majority.

Senator HOPKINS. We do not care whose type it is. It is a sea-level canal. I do not care whether it is the majority's or whose it is.

Mr. BATES. Yes.

Senator HOPKINS. I simply wanted to get your objections to any kind of a sea-level canal.

Mr. BATES. It has the most lower Chagres diversion work—an enormous quantity of it. It has the highest cost of excavation, because you have to do more rock work under water. It takes the most plant to do it. There is the least utilization of the old French excavation, because their spoil banks are so close to their line that half of them have to be dug out and carted away, so you lose half the advantage of the old French excavation, and the other plans lose a portion also. You have more pumping during construction on that plan than any other, and pumping is difficult. You have the greatest difficulties in the distribution of spoil. In this whole report of the advisory board I have not been able to find a single line that says where they are going to take the spoil from any part of the canal, practically.

Senator TALIAFERRO. The things you are stating now, Mr. Bates, go to the question of cost?

Mr. BATES. Yes.

Senator TALIAFERRO. And I intended to eliminate, in my question, all considerations of cost. Let me go back and see if I did.

(By request, the stenographer read the question of Senator Taliaferro, as follows:)

“Mr. Bates, what would you consider to be the ideal type of a canal across that Isthmus, disregarding the question of cost and the question of the time necessary to construct it? What do you regard, as an

engineer, the ideal type of canal across that Isthmus? Is it a lock or is it a sea-level canal?"

Senator TALIAFERRO. Now, that disregards the question of cost and disregards the time required to construct it.

Mr. BATES. Then it would be entirely from the standpoint of a ship?

Senator HOPKINS. Well, would it?

Mr. BATES. That is what I am asking you.

Senator TALIAFERRO. We want to get your ideas; at least I do. One of your objections to the sea level was that it retarded the speed of the vessels in crossing the isthmus?

Mr. BATES. Yes, sir.

Senator TALIAFERRO. Now, is there any other objection to a sea-level canal, disregarding the time and the expense of the construction of the canal?

Mr. BATES. Increasing the time of transit increases the risk to the ship.

I have my other points right here.

It has the greatest curvature affecting navigation. When there is a curve on a lake waterway, the curve does not affect navigation. When it is in a constricted channel, it does. There are the greater dangers of taking these curves. If you could have a sea-level canal without any reference to the Chagres regulation, without any reference to time or cost, then naturally it is an ideal type of canal; but you can not do it.

Senator TALIAFERRO. That is the kind of canal we ought to have, then; is it?

Mr. BATES. But you can not get it.

Senator TALIAFERRO. That is a question as between the engineers. If I go to you to solve an engineering problem, and you say to me, "I can solve that problem at this expense," I would be justified, it seems to me, in relying on your judgment and advice. There were assembled here in this city a number of distinguished engineers. They tell us without any qualification or question that the waters of the Chagres and of all of the small streams which traverse that section and which ordinarily would empty into that canal can be successfully controlled. Now, do you mean, Mr. Bates, to tell the committee that all of those engineers are absolutely wrong on that question of controlling the Chagres?

Mr. BATES. I have not said that they could not control it. What I do say is that in controlling it they use identically the principles which I advanced in my project and no other. You will find that there for the first time appears the under-sluice dam and the divided river.

Senator TALIAFERRO. I noticed that in your statement, Mr. Bates.

Mr. BATES. Yes, sir.

Senator TALIAFERRO. And I want to say that, however that may be, if it is so that this board has adopted your ideas in that respect, so much the greater hesitation, I take it, you would have in saying that the recommendation of the board was at fault?

Mr. BATES. The recommendation—

Senator TALIAFERRO. If they bring your ideas to us, we are ready to adopt them if they are good ideas.

Mr. BATES. I object to the sea-level canal on account of cost and time and life and sanitary conditions in constructing it, and when you

have got it you have not got a canal as good as the lock canal. It takes you 50 per cent longer time, with a big ship, to go through it, and I can not see any advantage whatever in the sea-level canal. You have to have one lock anyway.

Senator HOPKINS. Well, let me ask you this question: Is it not a fact that it would cost more to keep a sea-level canal clear, so that vessels could navigate it, than a lock canal?

Mr. BATES. Yes, sir; for dispatch, because you have got to have more stations—

Senator HOPKINS. But the point I am getting at is, would not the Chagres and the other rivers there on the Isthmus carry refuse matter into the canal that would lodge there and would have to be dredged out, and all that sort of thing, so as to make it more expensive and more dangerous to navigation than a lock canal?

Mr. BATES. By making the diversion, sir, on the sides big enough, it is my belief that you can keep the silt deposits out of the canal. I do not believe in resting the integrity of the whole sea level or any other enterprise on one great thing like the Gamboa dam. I would divide the risk.

Senator TALIAFERRO. You spoke of the health of the Isthmus.

Mr. BATES. Yes, sir.

Senator TALIAFERRO. I suppose you have studied health questions, sanitation, etc.

Mr. BATES. In my volume (the large one) I made as exhaustive study as possible of the records of the navy and army in the Tropics to show the relative health of a man afloat and a man ashore in the Tropics. It came out that the man afloat had from six to sixty times the immunity that a man ashore had. Consequently, the records appeared to absolutely demonstrate that the more lake area you had the freer you would be from military hazards, because you could operate a smaller force of highly skilled men and take extremely good care of them on a floating plant.

So that in the lock canal which I have advocated there is the most lake length that it is possible to get from Mindi to Obispo and from Miraflores to Sosa, leaving but about 8 or 10 miles which may be said to be land-locked or typical canal navigation. And in starting, I would first put in my dam at Gamboa across the Chagres, and then I would be afloat all the way to Bohio. I do the same thing at the same time on the other side, and then, next, I would have my dam at Gatun; and then I would have water all the way to the foot of the Culebra. You can have all but 8 or 10 miles absolutely finished in three years.

Senator HOPKINS. On a lock system?

Mr. BATES. Yes, sir.

Senator MORGAN. Your proposition has how many locks in it—three or four?

Mr. BATES. The preferred plan has four.

Senator MORGAN. Your plan?

Mr. BATES. The preferred plan, B, has four.

Senator MORGAN. Where?

Mr. BATES. One of them at Mindi, one at Gatun, one at Pedro Miguel, and the other at Sosa.

Senator MORGAN. That is all?

Mr. BATES. Yes, sir.

Senator DRYDEN. Now, about those breakwaters: You seem to think that there is a good deal of danger, or would be, in those harbors there in the event of storms.

Mr. BATES. Yes, sir.

Senator DRYDEN. Which both of the other plans call for?

Mr. BATES. Yes, sir; the east breakwater runs out from Colon Light to a point on the 40-foot contour. Right at that point is a reef carrying 22½ feet of water right under the lee of a ship entering, and that constitutes something which should be avoided if it can be. That breakwater is exposed to the trade winds, and, the water being deep, the blocks of which it is made, if you want to have a solid structure, would have to be 15 or 20 ton blocks. Otherwise they would be moved by the force of the sea.

On the west side we have a breakwater which is 4½ miles long. Now, the line of direction of a heavy sea in "northers" is slightly oblique to that, not at right angles, and not, as I take it, directly into the eye of the wind. I think that the line is more nearly this. [Indicating.] So that I have considered that it is unwise to make a breakwater across the bay, the water being so deep, but to make one in comparatively shallow water, 18 to 21 or 22 feet deep, starting from the vicinity of Mindi Point, making the channel from Mindi Point to this contour a submerged channel, just as your channel is at New York, or in leading up to Port Said, and in very many places in the world.

Senator HOPKINS. Right there, let me say that I may be mistaken, but my impression is that you could not have a channel of that character, the same as we have at New York, at that point. I would like to have you elucidate that a little.

Mr. BATES. In making a submerged channel, the maintenance of it consists simply of loading a hopper dredge, such as I am using at Galveston, and taking the material and either depositing it at sea or putting it in here [indicating].

Senator HOPKINS. Yes; I understand how you would put it out; but are not the trade winds and other conditions such that it would fill right up, and you could not keep it open?

Mr. BATES. I do not think so.

Senator HOPKINS. Well, have you made an investigation, Mr. Bates? Now, I do not know where I got the impression, but I have had the impression that it would be impossible to have that there; and if you have some personal or specific information on that subject, I would like to have you give it to us, as to the condition of the soil there, and the influence that the trade winds would have upon any such project as you have suggested.

Mr. BATES. In that portion of the bay which is outside of the 21 or 22 foot contour line you are below the line of wave motion. I have put my breakwater, then, to cover that portion of the bay where those difficulties would obtain, that being perfectly covered. This that is colored with blue here can be taken out, not with the hopper dredges, but simply put upon that reclaimed land, and as they would be quite free of wave motion that is easy to maintain. So that instead of putting out very expensive breakwaters here, or in this direction, the water, so to say, protects itself. I would expect to have, as all canals must have, powerful dredges of maintenance in order that any deposits might always be removed.

Senator HOPKINS. To keep it dredged out?

Mr. BATES. Yes, sir.

Senator MORGAN. Will you kindly point out there, Mr. Bates, where those two easternmost lakes are located?

Mr. BATES. On this plan—this is the plan A, with only two locks—one at Mindi and the other at Sosa Hill, on the other side a flat summit level. Then the lock is right here on the side of Jaramillo Hill. That is reached by a basin occupying the present bed of the old canal, but very much widened. Then from the lock over to the hill is a low dike or dam about 3,000 feet in aggregate length between those small hills, and that holds up a head of water in here of about 30, 32, or 33 feet, whatever you decide. On the four-lock canal I put in the Gatun dam from Gatun Hill to the westerly hill, which shows in more detail on one of these plans which you have already seen.

Now, on the Pacific side—

Senator MORGAN. No; I want to get that. What height of water do you get there at the Gatun dam above the sea level?

Mr. BATES. On the project B, the preferred one, the height here is 62 feet.

Senator MORGAN. Sixty-two?

Mr. BATES. Sixty or 62. On the other side of the dam it is, say, 33, making a difference of 29 feet. That means one lock at Mindi in this hill, another lock at Gatun in the Gatun Hill.

Senator MORGAN. What is the height of the lock at Mindi?

Mr. BATES. Thirty-three feet.

Senator MORGAN. Thirty-three?

Mr. BATES. Yes, sir.

Senator MORGAN. And then you add to that how much?

Mr. BATES. Twenty-nine, making 62.

Senator MORGAN. Sixty-two?

Mr. BATES. Yes, sir.

Senator MORGAN. And then, with that elevation there, you get 62 feet for the surface of your canal above the bottom of the prism—

Mr. BATES. You carry that clear to Pedro Miguel.

Senator MORGAN. Yes; to Pedro Miguel.

Mr. BATES. That is the point right here [indicating].

Senator MORGAN. Yes.

Mr. BATES. This would be the Culebra cut and here is Pedro Miguel [indicating].

Senator MORGAN. Now, you would fill all of that distance between Gatun and Pedro Miguel with the waters of the Chagres River and its affluents?

Mr. BATES. Yes, sir.

Senator MORGAN. You would find it quite sufficient, would you?

Mr. BATES. Yes, sir.

Senator MORGAN. No danger of running it down in case of a heavy patronage of the canal?

Mr. BATES. I think not. I think you would have capacity for 100,000,000 tons.

Senator MORGAN. The only water supply you would have would be the rainfall—

Mr. BATES. The run-off, the watershed of the whole distance.

Senator MORGAN. You would have the watershed of the Chagres and its affluents between Gatun and Pedro Miguel?

Mr. BATES. Yes, sir.

Senator MORGAN. You would take them all in?

Mr. BATES. Yes, sir.

Senator MORGAN. With no controlling works anywhere except at the two dams?

Mr. BATES. At Gamboa and at Alajuela; and I also propose a dam on the Cano, which is quite a little stream.

Senator MORGAN. You propose to put in a dam at Gamboa?

Mr. BATES. At Gamboa.

Senator MORGAN. And at Alajuela?

Mr. BATES. And at Alajuela. Each of them has exactly the same height as the Assouan dam. I would also have a dam on the Cano, which has quite a watershed.

Senator MORGAN. You want those dams to prevent the flood waters from coming into this great basin you have here?

Mr. BATES. Yes, sir; I want to let the water into the basin gradually in case of a flood.

Senator MORGAN. Why do you want a dam at Gamboa and also at Alajuela?

Mr. BATES. Because I want to divide the risks.

Senator MORGAN. You want to divide the risk?

Mr. BATES. Yes, sir; either dam would be big enough to work alone; just exactly as in feeding a steam boiler on a vessel you have two feed pumps, so if one breaks down you have another one.

Senator MORGAN. You want to make security doubly secure?

Mr. BATES. Doubly secure; so that I have in this plan the lake navigation—that is, the lake navigation of the Chagres exactly as in the minority plan, but a little lower. I have also the dam regulation; so that where they have one element of safety I have more.

Senator MORGAN. You have the undersluice there at the Gatun dam, and then you have the dam at Gamboa, and the dam at Alajuela?

Mr. BATES. Yes, sir.

Senator MORGAN. That is three. Are there any other regulation works?

Mr. BATES. There is one at Cano.

Senator MORGAN. Yes; that is for navigation rather than to fence off the waters that come flowing into the prism of the canal, is it not?

Mr. BATES. That is to keep out any possible disturbance from floods or from the watersheds.

Senator MORGAN. Yes. This map, then, is not a correct delineation of your plan?

Mr. BATES. Yes, sir; this is the Panama side; that is Ancon Hill; this is Sosa Hill; these are the islands in Panama Bay; that is the reef, the San José rocks; and I call your attention to the fact that in both the majority and minority plans there are channels across this reef.

Their maps, their plans, and the French, all stop at this point, and take no cognizance of this San José reef, which I have marked from the latest surveys; so that the alignment given on this plan and on the other one would have to be changed, or they would have to have extra work at this point. Then, at Panama the new town site is mainly made up of Culebra material, that being the most available spoil area.

The literal drift in Panama Bay is such that whatever channels are made out into Panama Bay will be subject to refilling and incessant dredging unless there is a breakwater which cuts it off. Consequently, I would utilize the Culebra material to make these breakwaters. They would have, also, a certain military value.

Senator MORGAN. Are those stone works?

Mr. BATES. Yes, sir. There is a section of the breakwater which is the same as the section of the Plymouth breakwater, in England.

Senator MORGAN. Built of riprap?

Mr. BATES. It is built of various character and sizes of rock. What is called third-class rock forms the core; that is, rock that two men can lift. The second-class rock is rock weighing up to 2 or 3 tons; and first-class rock is rock weighing from 5 to 10 tons, which you put on any exposed surface.

Senator MORGAN. How far is the eastern end of that breakwater from the city of Panama?

Mr. BATES. It is 4 miles.

Senator MORGAN. On the shore, how far is it from the city?

Mr. BATES. From the city of Panama?

Senator MORGAN. Yes.

Mr. BATES. It is about two miles and a half. Two miles and a half either way brings you to the shore ends of the breakwater.

Senator MORGAN. You propose to surround the city of Panama on two sides?

Mr. BATES. All except their water front; it does not interfere with their present water front; and this land that it covers is most of it bare at low tide. I hold that that forms the nearest and safest spoil basin or spoil area for the Culebra spoil.

I would like to add, relative to the sea-level canal, that it does not permit the passage of vessels so readily, and that there is no provision for turning.

(Mr. Bates was thereupon excused, and the committee went into executive session, after which an adjournment was taken until to-morrow, Tuesday, March 13, 1906, at 10.30 o'clock a. m.)

ISTHMIAN CANAL.

COMMITTEE ON INTEROCEANIC CANALS,
UNITED STATES SENATE,
Washington, D. C., Tuesday, March 13, 1906.

The committee met at 10.30 o'clock a. m.

Present: Senators Millard (chairman), Kittredge, Dryden, Hopkins, Knox, Ankeny, Morgan, and Taliaferro.

(The following paper, which was submitted by Mr. Bates at the close of yesterday's session and which contains a summary of his views as to the best type of canal to be constructed across the Isthmus of Panama, is, by direction of the committee, printed as a part of the record:)

THE 60-FOOT LOCK AND LAKE CANAL.

Indorsed by the majority of the Board of Consulting Engineers as the best lock and lake canal, page 35. So believed by Mr. Bates with the changes italicized, because:

This canal fulfills, as the 85-foot canal does not, the elementary conditions of safety and adequacy—

1. No head of over 35 feet is impounded by a dam on alluvial foundations.
2. Locks are the full 1,000-foot dimensions.
3. Locks are never in flight, so that the dangers of overrunning are minimized and the divided lock can be used for small ships, saving lockage water.
4. The risks are averaged over many units.

MINDI CANAL ENTRANCE

Atlantic Limon Bay approach half way between Point Toro and Colon giving straight entrance free of reefs to Mindi.

Balboa, a new city to be made opposite Mindi, on the hill between Lake Chagres and the inner salt harbor in Limon Bay.

First lock and low dam making Lake Chagres at 30+ foot level.

Second lock and dam making Lake Gatun-Bohio at 60+ foot level.

By this arrangement the difference in levels or head is but 30 feet. Since dredges can pump up material 35 feet, the dam can be built by them. The locks are separated, not in flight.

The majority plan puts the first lock at Gatun, and the second and summit-level lock at Bohio. But by this latter location only the limited amount of water above Bohio is available for lockage.

The Bates plan puts the second or summit-level lock at Gatun. Thus the full amount of lockage water above Gatun is available, and the first lock at Mindi.

Gamboa sluice dam is proposed to intervene between the upper Chagres floods and the canal at Gamboa. The regulated discharge

passes through the dam sluices and is sent part to the Atlantic and part to the Pacific down the canal.

The majority proposes a 180-foot dam sustaining a deep lake. *Instead of this the Bates proposal is to average the risks over two lower similar dams 117 feet high, sustaining no lake but having behind them basins normally empty to catch the floods.*

At Pedro Miguel the third lock brings the level from that of Lake Gatun-Bohio 60+ feet to that of Lake Panama 26+ feet.

At Ancon Sosa the fourth lock gives the lift between Lake Panama and the Pacific Ocean level.

Greater Panama.—Lake Panama at 26+ foot level makes possible an inner fresh harbor and hill-protected naval station, as at Balboa. It is proposed to use Culebra rock to make great breakwaters, whose heads will be the Panama Harbor islands. Inside these, on the tidal flats, the great central excavation can be deposited to reclaim a greater Panama.

While the decision as to type is being made, the Culebra work necessary for any canal might be done and these breakwaters and reclamation used as the places for disposal of the spoil. This is the only way by which real work can be started at once without the deposited material interfering with the ultimate adoption of any type of canal, for this harbor improvement is incontestably available and desirable for all.

(The chairman submitted the following papers, which by direction of the committee are printed as part of the record:)

ISTHMIAN CANAL AFFAIRS,
OFFICE OF ADMINISTRATION,
Washington, D. C., March 7, 1906.

DEAR SIR: Referring to the data which your committee asked me to furnish when I was before you yesterday, I have the honor to advise:

First. When the Isthmian Canal Commission purchased the steamers *Havana* and *Mexico* from the New York and Cuba Mail Steamship Company (Ward Line) that company was carrying insurance to the amount of \$425,000 on each steamer, at an average rate of 3.64 per cent. The Panama Railroad Company is now carrying insurance to the amount of \$656,000 on each of these steamers, at an average rate of 3.28 per cent, in favor of the Isthmian Canal Commission, from whom they are leased. These steamers are rated A 1 for twenty years from 1899, the year they were built. This rating was in force when the vessels were purchased from the Ward Line and is still in effect.

Second. I send you herewith copy of the report of survey and inspection on each of the above-mentioned steamers which was made at the time of the transfer from the Ward Line to the Canal Commission.

Third. I send you herewith copy of report made by Mr. E. L. Farnham, dated London, June 2, 1905, and New York, July 15, 1905, concerning his investigation as to the purchase of various foreign ships for the Commission.

Fourth. The cost of the new linen, china, glassware, and silverware purchased for the steamers *Havana* and *Mexico* since their receipt from the Ward Line was \$7,070. Part of the linen, china, glassware, and silverware which we received with the steamers *Mexico* and *Havana* from the Ward Line is being used by the Commission for other pur-

poses, and part of it will be returned to the Ward Line at valuation to be agreed upon as it bears their monogram.

Fifth. I send you herewith copy of the minutes of the meeting of board of directors of the Panama Railroad Company at which the sale of bonds was authorized. These bonds were sold to Mackay & Co., 16 Nassau street, New York, the highest bidders, and repurchased from them as per my testimony of yesterday.

Sixth. No materials have been purchased by the Panama Railroad Company for the Isthmian Canal Commission since February, 1905, except the lot of rails mentioned in my testimony of yesterday, which were purchased in March, 1905. The Canal Commission has purchased its own rails as well as all other material needed by it since that time. No purchases have at any time been made by the Canal Commission for the Panama Railroad. The requisitions for material needed by the Canal Commission are made on requisition blanks headed "Isthmian Canal Commission," and the requisitions for material needed for the Panama Railroad are made on requisition blanks headed "Panama Railroad Company."

Seventh. A statement of material purchased in the open market without advertising since December 1, 1905, is being prepared and will be sent you in a few days.

Very respectfully,

T. P. SHONTS, *Chairman.*

Hon. J. H. MILLARD,

*Chairman Committee on Interoceanic Canals,
United States Senate, Washington, D. C.*

NEW YORK, July 14, 1905.

T. P. SHONTS, Esq.,

*Chairman Isthmian Canal Commission,
24 State street, New York City.*

DEAR SIR: In accordance with your instructions of July 6 we have surveyed and inspected the steamship *Mexico* while lying afloat at pier 18, Brooklyn, and also while in the dry dock at Erie Basin, and beg to advise.

Upon examining the various holds, decks, bulkheads, coal bunkers, and sides of the vessel in same, and the ironwork generally, found the same to be in very good condition and having the appearance of having been well cared for, the only defect found being a slight leak in the margin of the main deck, which requires calking.

The windlass, winches, steering engine, and other deck fittings were found in good order and condition.

The lifeboats and life rafts, together with their fittings, in good order and condition.

The joiner work, deck houses, bridge rails, etc., in good order and condition with the exception of the engine-room skylight cover, which is racked and should be renewed.

The engines and boilers, together with the pumps and the other auxiliary machinery, in good condition.

Upon examining the vessel in the dry dock found the bottom to be in good condition, with the exception that the paint there had been

scraped off in a number of places, but that the plating was free from defects.

The fair-waters over the couplings of the outboard shafting were removed, and upon examining the couplings and also the nuts on the end of the tail shaft found the same to be in good condition.

The shafting and couplings were scraped and painted before replacing the fair-waters.

The propellers, which are of the three-bladed solid bronze pattern, were slightly nicked on the edge of some of the blades, one blade of the port propeller showing a slight crack in same, which we do not consider serious.

The rudder, together with the stern frame, found in good condition.

In view of the above facts, we are of the opinion that this vessel is in good condition for practical service for the balance of her classification life of the hull, machinery, and appurtenances generally, which go to fit a vessel for immediate sea service.

Yours, truly,

HORACE SEE,

FRANK S. MARTIN,

Consulting Engineers and Naval Architects.

REPORT OF SURVEY ON STEAMSHIP HAVANA.

NEW YORK, August 3, 1905.

Mr. E. A. DRAKE,

Assistant to President, 24 State Street, New York.

DEAR SIR: In accordance with your instructions of July 6 we have surveyed and inspected the steamship *Havana* while afloat and also while in the dry dock at Erie basin and beg to advise:

Upon examining the various holds, decks, bulkheads, coal bunkers and sides of the vessel in same, and the ironwork generally, found the same to be in very good condition and having the appearance of being well cared for, the only defect found being a slight leak in the margin of the main deck which requires caulking.

The windlass, winches, steering engine, and other deck fittings were found in good order and condition.

The lifeboats, with one exception, are indented and should be tested in the water for tightness, otherwise they and the life rafts, together with their fittings, are in good order and condition.

The joiner work, deck houses, bridge rails, etc., in good order and condition, with the exception of the engine-room skylight cover, which is racked and should be renewed.

The engines and boilers, together with the pumps and the other auxiliary machinery, in good condition.

Upon examining the vessel in the dry dock found the bottom to be in good condition, with the exception that the paint there had been scraped off in a number of places; the plating, however, was free from defects except above water line, which showed a few indentations. Bottom since then has been thoroughly cleaned and painted.

The fair waters over the couplings of the outboard shafting were removed, and upon examining the couplings, and also the nuts on the end of the tail shaft, found the same to be in good condition with the

exception of starboard shaft, which has been removed and replaced by a spare one.

The shafting and couplings were scraped and painted before replacing the fair waters.

The propellers, which are of the three-bladed, solid bronze pattern, were slightly nicked on the edges of some of the blades.

The rudder, together with the stern frame, found in good condition.

In view of the above facts, we are of the opinion that this vessel is in good condition for practical service for the balance of her classification life of the hull, machinery, and appurtenances generally which go to fit a vessel for immediate sea service.

Yours, truly,

HORACE SEE,
FRANK S. MARTIN,

Consulting Engineers and Naval Architects.

Extract from minutes of meeting of the board of directors of the Panama Railroad Company, held at the office, No. 24 State street, New York, on Wednesday, November 8, 1905, at 11 o'clock a. m.

Present: Messrs. Shonts, Cromwell, Endicott, Hains, Obaldia, Farnham, and Drake.

FINANCIAL CONDITION.

Consideration was given to the necessity for providing means for the payment of the equipment authorized by the board, as well as for other important improvements to the company's property and facilities on the Isthmus which were being undertaken, so as to provide for the prompt, economical, and profitable handling of the large amount of traffic to be expected from the general development of commerce, and the construction of the Isthmian Canal; and the president outlined to the board the many improvements which had been undertaken and which were under contemplation, among them being the construction of new piers at the Atlantic terminus, the extension of existing piers, the installation of modern facilities for the prompt handling of coal and general cargo from steamers, the erection of refrigerating plant, laundry, and bakery, and the construction of an additional pier at La Boca.

The president also explained that during the period of installation of these modern facilities the expenses of conducting the property would, as usual in such cases, increase to a much larger extent than the earnings, and that while the payment of the balance of approximately \$625,000 due to the company by the Isthmian Canal Commission would probably be made in the course of a few months, it would become necessary to provide for the payment of indebtedness already or about to become due.

The president and treasurer made a full report regarding the present financial condition of the company. They advised the board that the Isthmian Canal Commission was unable to pay its indebtedness of about \$625,000 either now or in the immediate future, and that this company had practically exhausted its cash resources in the purchase

of equipment, material, supplies, and for construction, etc., having in hand but \$114,184, which was needed for current operations; that there were overdue accounts for equipment, material, and supplies to the amount of \$208,000, and other accounts of a similar nature falling due within the next sixty days amounting to \$445,000, and that there were still other obligations on account of contracts made and maturing within the next four months, amounting to \$1,132,000; that this condition arose from the extraordinary amount of equipment, supplies, material, and construction which had been made necessary to further the operations of Isthmian Canal Commission in construction of the canal; and that this company had relied upon the Commission to pay its bills, or otherwise to aid the company, but that as the Commission was unable so to do it had become necessary for the company to itself finance its affairs.

They also advised the board that the only available resources of the company were the 628 $4\frac{1}{2}$ per cent bonds in the treasury, and which were created for the very purpose for which the moneys had been expended, viz, for equipment, construction, material, supplies, etc.

It further appeared that the said bonds could by their terms be called in and redeemed by the company on any interest date at 105, so that if the bonds were sold at this time they could be redeemed at 105 on the 1st of next April if the company should so desire. After consideration it was upon motion duly

Resolved, That the executive officers be, and they are hereby, authorized to sell the 628 Panama Railroad $4\frac{1}{2}$ per cent twenty-year sinking-fund gold bonds now held in the treasury at as favorable a price as possible, but not less than 104 $\frac{1}{2}$, the proceeds thereof to be applied to the purchase of equipment and the improvement of the company's facilities.

It was further

Resolved, That upon completion of the sale of the 628 Panama Railroad $4\frac{1}{2}$ per cent twenty year sinking fund gold bonds, above authorized, at not less than 104 $\frac{1}{2}$, the officers be, and they are hereby, directed and authorized to take the proper steps for the listing of same on the New York Stock Exchange; and the committee of securities are hereby requested to remove said bonds from the company's vaults and hand same to the treasurer of the company for delivery to the parties to whom the bonds are sold.

A true copy.

T. H. ROSSBOTTOM,
First Assistant Secretary.

NEW YORK, July 15, 1905.

THEODORE P. SHONTS, Esq.,
President Panama Railroad Company,
24 State Street, New York City.

SIR: I have the honor to submit to you and the board of directors of the Panama Railroad Company the following full report of the mission I was directed to undertake by resolution of the Board at its meeting held on the 16th of May last, which resolution reads:

“Resolved, That Director Farnham be made a general agent of the company, at an appropriate salary to be fixed by the president, and

the latter is hereby authorized to send Director Farnham abroad for the purpose of securing options on two or three vessels of the character required by the company and report the result of his investigations by cable."

Prior to the passage of the foregoing resolution, and considering the pressing requirements of the Panama Railroad Company in respect of its steamship line, the general opinion of the board was that the company needed two or three steamships, preferably twin screws, of approximately 15 knots speed, 5,000 tons cargo capacity, with accommodations for 100 first and 50 second class passengers; and it was to obtain for the company steamships of this type that, acting under the resolution of the board, above recited, and general instructions of the executive committee, I sailed from New York on the steamship *Cedric* on May 19 for Liverpool, where I arrived May 27.

Shipping circles abroad had been advised through the press of my mission, and from the moment of landing numbers of vessels of all sorts were offered by ship brokers and shipowners representing the principal ports of Great Britain and the Continent.

I wish to say that whenever a vessel was submitted that merited consideration, I endeavored to deal direct with the owners; and in all cases, whether agent or owner, I made it clearly understood that no vessel, however desirable it apparently might be, would be purchased by the Panama Railroad Company until it had passed complete inspection in dry dock by both Lloyds and the British corporation. Also that all representations in respect to speed and coal consumption must be corroborated by the submission for inspection of the ships' logs, covering a period of six months' operation. These stipulations caused more or less dissatisfaction and the elimination from consideration of many vessels offered.

Upon my arrival in Liverpool I saw the steamship *Zungeru*, one of the vessels offered for sale. She was just sailing on her regular voyage to the Kongo and I was able only to look her over in a general way. Later, at Antwerp, I completely inspected her sister ship, the *Leopoldville*, also for sale.

These ships I will refer to hereinafter.

From Liverpool I proceeded to London, which is the real center of the shipping business of Great Britain and much of the Continent, and during my stay abroad London was generally my headquarters.

I reached London Saturday night, May 27, and the next three days my entire time, day and evening, was occupied meeting brokers and owners with ships for sale, looking over their memoranda and photographs of the same, and sifting out the most likely ones.

May 30 I went to Newcastle-on-Tyne to see several vessels at the shipyards there, particularly a large new vessel just completed at the yards of the Sir William Armstrong-Whitworth Company. In respect to this vessel I can add nothing to what I reported to you in my letter of June 2 and in subsequent cables, copies of which are hereto attached and made part hereof. Other ships on the Tyne which were to be had I found upon personal inspection so deficient in either speed, passenger accommodations, or size of hatchways, or requiring such alterations in other respects that I dismissed them from further consideration.

Returning to London, I went to see several steamships at the Albert docks and the India docks, among them two steamships of the Union-

Castle Line, formerly in the trade to the Cape of Good Hope, but at that time laid up. Two of these vessels, the *Dunnotar Castle* and the *Arundel Castle*, met—so far as passenger accommodations, cargo capacity, draft, etc., are concerned—the requirements, but their logs showed a speed of 13 to 13½ knots at best, and they are also old ships.

Another vessel of the Union-Castle Line, the *Scot*, which was repeatedly pressed upon me, and I was also told efforts were being made at the same time here to have the company charter her, I found to be as fast as represented (16 knots), but she is a very large coal consumer (about 140 tons a day), and her passenger capacity (over 200 first class), is too great, while her cargo capacity (only 2,600 tons), is too small. She is all machinery and coal bunkers, and I declined to further consider her.

The *Arundel Castle* would have done to charter and I so advised you in my cable of June 11, in which I gave particulars of such vessels as I found suitable for charter.

Other steamships that I went to see were the *Miltiades*, a new ship in the Australian trade and the finest vessel in all respects I saw in London, an ideal vessel for the Panama Company, but too expensive—\$1,000,000; and the steamship *Moravian*, a well-built ship, but rather small and hatches far too small for your purposes.

At Gravesend I went over the Atlantic transport liner *Menominee*, one of three vessels—all alike—offered for sale or charter by that line.

I was aware of the great efforts being made to get one or more of these ships into the employ of the Panama Railroad Company, but, as I reported to you in my letter of June 2, I found the ship too large, too slow, too much refrigerating space, which the Panama Company could not utilize in any way, and the charter price too high to warrant the employment of any of these vessels.

After looking over all the vessels which came nearest the Panama Company's requirements I forwarded to you on the 2d of June, for the consideration of yourself and the board of directors, a report and memoranda respecting these vessels, which is the letter annexed to which I have previously referred.

In respect to the speed desired by the Panama Railroad Company—15 knots—my investigations showed that there were in the market few, if any, vessels with a speed of over 14 knots, except a few fast mail and passenger ships of the type of the *Scot*, above described.

All the largest ship owners and builders told me that a speed above 14 knots meant larger and more expensive boilers and engines and a coal consumption much greater than they considered the ordinary operation of a steamship line on their side warranted. Therefore a greater speed than 14 knots was only to be found in fast mail steamers, or in steamers built for special fast trade. Because of this I submitted to you in my report ships having the best speed obtainable, but all under 15 knots.

Following the mailing of this letter I cabled the company as follows:

LONDON, June 4, 1905.

PANRAILCO, New York.

Per *Lucania* mailed important letters to-day concerning steamships. Believe have found what will be satisfactory. Suggest you arrange with president board of directors for prompt consideration upon receipt

of letter. Desirable under the circumstances decision of the board should be sent me as quickly as possible by cable.

FARNHAM.

On the 5th of June I received from the company at New York the following cable:

NEW YORK, June 5, 1905.

FARNHAM, *Credonais*, London.

In every proposal obtain first, lowest cash price, second, lowest charter rate with longest possible option purchase.

PANRAILCO.

I at once made direct inquiry of owners or agents of all vessels suitable for the company that could be had under charter. Owners, I found, desired to charter on British Government form, which includes with the vessel the crew, maintenance of same, and insurance, the charterer furnishing the coal and paying all port dues. After cleaning up the possibilities of Liverpool, London, Glasgow, Hamburg, and Antwerp, in respect to charters, I cabled you on June 11 as follows:

LONDON, June 11, 1905.

PANRAILCO, *New York*:

In reply to your telegram and as a supplement to my letter the Newcastle ship and *Byron* and *Tennyson* can not be chartered. *Leopoldville Zangeru*, I send a full description by letter, can be chartered at the rate of £3,250 each; other vessels too old to buy, but do for present requirements which can be chartered are as follows: Dimensions are in shipping record; *Arundle Castle*, 4,000 tons cargo; passengers, 75 first class, 50 second; 13 knots on 52 tons coal; price, £2,750. *Cambroman*, 4,200 tons cargo; passengers, 72 first class, 78 second; 13 knots on 70 tons; £2,836. *Vancouver*, 4,000 tons cargo; passengers, 128 first class, 57 second; 13 knots on 75 tons; £2,646. Atlantic transport boats are too large Panrailco's profitable use. All charter prices quoted are payable monthly. Vessel will be delivered here on British Government form, whereby owner provides complete crew, feeds same, and insures ship; you provide coal and pay port dues. Think above charter prices are too high. Cause is generally believed to be eastern war. Many steamships much passenger and little cargo space, charter or sale cheap. Very few ships right proportion of combination Panrailco wants.

FARNHAM.

Meantime, my letter of June 2 had been received by you and considered, and I received the following cable on June 12, delay in delivery being due to a general holiday in England:

NEW YORK, June 10, 1905.

FARNHAM, *Credonais*, London:

Your letters arrived to-day. Committee favorable to purchase Newcastle steamer with conditions of alteration and delivery as reported, but in order to justify submission to President R., must have definite refusal one week on the best terms possible, but under no circumstances exceeding £100,000. Secure and cable definite written refusal.

PANRAILCO.

I at once saw the managing director of the Armstrong-Whitworth Company, Mr. Swan, but he declined to give any refusal for the price offered, or a written refusal at all, except at a price acceptable to his company. Mr. Swan told me that there were other possible purchasers in the market, and his company did not care to tie themselves up for any length of time. He indicated that the lowest price they would consider was £108,000, but I felt satisfied that with authority to offer that as a last resort, and a few days' time, I could drive a better bargain. So I cabled you on June 14 as follows:

LONDON, June 14, 1905.

PANRAILCO, *New York*:

Newcastle people absolutely decline to give us refusal at £100,000. Have indicated they will accept £108,000, equal to \$527,000. Believe if authorize me to make bid up to this amount think this price can probably be reduced a little, but can not get refusal steamer at less.

FARNHAM.

You replied to that from Washington on the 15th of June thus:

WASHINGTON, June 15, 1905.

R. L. FARNHAM, *Hotel Cecil, London*:

Offer Newcastle people £100,000 sterling flat. If they do not accept get best refusal on *Tennyson* and *Byron*, one ship. American owners Atlantic transport here pressing us on izzard.

SHONTS.

To which I thus replied, after a further conference with Managing Director Swan and the owners of the *Byron* and *Tennyson*:

LONDON, June 15, 1905.

PANRAILCO, *New York*:

Newcastle firm absolutely decline offer, say ship cost more. *Byron* *Tennyson* owners have fixed price, two vessels, £155,000. Prefer not selling singly. I think advisable to try offer £80,000 one only, delivery beginning July. Presence other purchasers prevents getting written refusal from all owners except on firm offer from us. Personally think Newcastle ship better value take everything into consideration, even at £108,000 sterling.

FARNHAM.

On the same day I received from you at Washington the following inquiry:

WASHINGTON, June 15, 1905.

FARNHAM, *Hotel Cecil, London*:

Have you seen steamers *Port Royal* and *Port Antonio*, owned by Elder Dempster & Co., Liverpool? If so, what is your opinion? If not, investigate and advise.

SHONTS.

I saw by this inquiry respecting the steamships *Port Royal* and *Port Antonio* that the fact that these vessels had been offered to and considered briefly by the company before I sailed had been overlooked. They had been offered again to me in Liverpool, but when I described

our requirements the owners themselves recognized that the vessels were too small.

I also had been informed that misrepresentations in respect to speed, etc., of certain vessels submitted to and rejected by me in London were being made by interested brokers in New York direct to the New York office, and thinking that such statements might mislead, and also replying to your inquiry re *Port Royal* and *Port Antonio*, I sent the following explanatory cable:

LONDON, June 16, 1905.

PANRAILCO, *New York*:

In order that you are to understand situation, there are not many vessels that meet all requirements Panrailco in respect to age, ability carry 4,500 to 5,000 cargo exclusive bunkers, size of holds, hatches, cargo handling, a sufficient amount cabin-passenger accommodations, and upward 13 knots. Other buyers for similar vessels here, and owners will not tie themselves up with option, does not include forfeit and are not certain of sale. If I am able to make firm offer certain sum, can then secure option for a short time if offer is acceptable. Consider *Port Royal* and *Antonio* too small cargo, too slow, too many alterations necessary meet our requirements, and owners here agree with me. Atlantic transport ship is too large, too much draft, too much waste unavailable refrigerator space to make vessels economical, and charter price high. *Byron* due now New York. Almost certain can get option *Byron* alone, but if you want to purchase *Byron* and get delivery before she sails another voyage it will be necessary enable me promptly make definite offer owners here. Consider *Byron* good all-round ship Panrailco purposes, good speed on economical fuel, but considering her age, size, average depreciation, and price, with same features Newcastle ship, think latter, even at their price, best of two for Panrailco. *Byron* as handsome and well finished as Newcastle is homely; poorly finished cabins, but latter will take place of two Panrailco's present ships and carry larger pieces. Outside experts hold same views.

FARNHAM.

The next day I received a cable from the company, the purpose of which I quite understood and which was as follows:

NEW YORK, June 17, 1905.

FARNHAM, *Credionais, London*:

Your instructions were to approximate 5,000 tons cargo capacity ship exclusive bunkers, 15 to 16 knots, side ports, large hatches with corresponding cargo facilities, refrigeration plant, 100 first class, 50 second class passenger accommodations, twin screw preferred. Newcastle good boat, but too slow. Don't waste time on slower than 15-knots boats.

and to which I at once replied—

PANRAILCO, *New York*:

Requirements, instructions, Panrailco fully understood, but no 15-16 knot vessels can be obtained in English, German, or French market, except a few large mail boats, too little cargo and too large passenger capacity; prices upward \$700,000. *Port Kingston* only one can meet

all requirements Panrailco; can be bought probably \$900,000, asking \$1,000,000. Therefore submitted all others nearest suitable. Await instructions before proceeding further.

FARNHAM.

In the meantime I had met some of the larger shipbuilders of Belfast and on the Clyde, who discussed the subject of building such vessels as the Panama Railroad Company desired; and having in mind the suggestion made by several members of the board that while abroad it might be advisable that I ascertain what it would cost to build abroad two such vessels as the company had invited proposals for from American builders, I took up that subject. I had taken with me the same specifications and drawings of a vessel which the Panama Railroad Company had submitted to several shipbuilding firms in the United States, upon which it had asked and received proposals to build two ships.

Hearing also that at one of the yards on the Clyde there was a steamer about completed which might suit the Panama Company, I went to Glasgow for the double purpose of seeing that vessel and seeing some builders in respect to getting proposals for building.

The vessel building, while near what the company desires in respect to passenger and cargo and speed, has too many decks to be useful for carrying anything but small packages of cargo. Small hatches and heights between decks are insufficient to permit the stowing of any large freight.

I visited some of the large shipyards on the Clyde from Glasgow to Greenock; consulted with the builders and obtained from some of the best and largest proposals for the construction of two steamships, which I submit as a separate matter.

While in Glasgow I received the following cable:

WASHINGTON, D. C., June 21, 1905.

FARNHAM, *Hotel Cecil, London*:

Does *Zungeru* approximate our requirements?

SHORTS.

To which I replied:

LONDON, June 21, 1905.

PANRAILCO, *New York*:

Regarding *Zungeru*, refer to my letter of June 2; will not be available until two months; consider these ships relatively dear in view of cargo capacity.

FARNHAM.

I again saw Mr. Swan, of the Armstrong-Whitworth Company at Newcastle-on-Tyne, and two other directors of the company, Mr. Ord and Mr. White, and had a long discussion about their steamship which they had for sale. They explained that they did not feel like making an offer of sale at a lower price than £108,000 without a surety of its being accepted; that if it was rejected they would have only lowered the price against themselves to some other purchaser, but if I was prepared to make a firm offer somewhere between what I had offered and what they had asked a bargain probably could be concluded.

Therefore I cabled you on June 22 as follows:

LONDON, *June 22, 1905.*

PANRAILCO, *New York:*

After conference to-day Newcastle people I think they would seriously consider offer £105,000, including alterations. If you desire to make further offer, instruct by telegraph. If not, think it is advisable I return quickly, and with such complete data all vessels as will enable you to make prompt final decision. Nothing further to be gained remaining here longer. Await telegraphic instructions.

FARNHAM.

And in the absence of any answer I again cabled, on June 25:

LONDON, *June 25, 1905.*

PANRAILCO, *New York:*

What do you think of my suggestion to return? Everything has been sent for your consideration that is likely to suit Panrailco under last price of Newcastle ship. What do you desire me to do?

FARNHAM.

To which I received the following reply:

NEW YORK, *June 27, 1905.*

FARNHAM, *Credona's, London:*

Approve suggestion your telegrams 22, 25 that you return promptly, bringing full data for action here. Advise date sailing.

PANRAILCO.

Meanwhile the owners of the *Zungeru* and *Leopoldville* notified me that the latter vessel had arrived at Antwerp and desired very much that I see her.

I went to Antwerp and spent several hours on the vessel, going all over her. As I wrote you the *Zungeru* and *Leopoldville* are sister ships, and the superficial inspection which I could only give the *Zungeru* at Liverpool was completed when I went over the *Leopoldville*. They are up to date in all respects, saloons beautifully finished, everything first class throughout, but as I said in my report and cable they have not the room in their holds for the sort of cargo that will go to the Isthmus.

The approval of my suggestion to return with all data to enable the board to reach a definite decision, which reached me as above recited on June 28, arrived too late for me to secure return passage before the sailing of the *Deutschland* from Dover July 7, and so I engaged for that steamer, and arrived in New York on the evening of July 13.

I brought with me memoranda of dimensions, carrying capacity, both for passengers and cargo, and details regarding engines, boilers, speed, etc., of a number of vessels, and blueprints and photographs of some, all of which are tendered herewith for your consideration.

Respectfully submitted.

R. L. FARNHAM.

HOTEL CECIL, LONDON, W. C.,
June 2, 1905.

THEODORE P. SHONTS, Esq.,
President Panama Railroad Company,
24 State street, New York City.

DEAR SIR: I herewith report to you for the consideration of yourself and the board of directors of the Panama Railroad Company the results to date of the mission which I was directed to undertake by resolution of the board at its meeting on the 16th of May last.

Pursuant to the general instructions of the executive committee of the company, following the resolution referred to, I sailed from New York on the steamship *Cedric* on May 19, reaching Liverpool May 27 and London on the night of the same day.

Immediately upon my arrival at Liverpool several of the leading ship brokers submitted to me plans and data of a number of steamships which they thought might meet with the requirements of the Panama Railroad Company, which, they understood, desired to charter or purchase two or more steamships for use between New York and Colon. After a conference with the Liverpool brokers in respect to the vessels they offered I came on to London.

I spent nearly all of the first day I was in London (Sunday) in conference with a number of ship brokers who came to see me, bringing plans and specifications of steamships which they had to offer for charter and for sale. The following morning (Monday) I started out to inspect the most promising, for the purposes of the company, of the many vessels offered, and from that time until the hour of writing this I have been constantly busy on this work.

Many ships were submitted which, for one reason or another (either they were too large or too small, or too slow, or their coal consumption too great, or they were freight boats simply), I dismissed from consideration. The vessels which I submit and describe hereinafter appear to be the ones most suited to the requirements of the company. You will recall that among the vessels submitted to the board of directors was a new twin-screw steamship just being finished at Newcastle-on-Tyne, which vessel, from the few details given to the board of directors, appeared to be about the vessel desired, and it is this vessel which I will first report on.

I went to Newcastle and spent an entire day on this steamship. She has been thoroughly gone over by the representatives of Lloyds and has been classed in Lloyds' list 100 A1. I had go over the ship with me an official of the British corporation, the rival organization to Lloyds, and at the end of the day he said of the ship the same that is true of Lloyds' inspector, viz: That in every respect the vessel fully met every requirement of both organizations and of the board of trade in respect to strength of construction, etc., and in many features, particularly in the framing and construction of the hull, she considerably exceeded Lloyds' requirements.

In order that you and the members of the board may better understand my description, I inclose herewith a blueprint of this vessel, and also send back the blueprint (which I brought with me) of the vessel which the company planned to build, in order that you may be able to compare the two. The blueprint of the British ship is loaned by the owners, but I have promised that it will be returned to them as soon as you have considered it. This ship was ordered from the Arm-

strong Company by a London concern, which has been running a line of passenger and cargo boats in the African trade for the last forty years. During her construction this company entered into a traffic agreement with a competing company which obligated them to put no more passenger boats on their line, and as a result they left this ship on the builder's hands, taking in her place a large cargo steamer.

The ship is 435 feet over all; 51 feet 6 inches beam and will draw, fully loaded, 25 feet. She is a great big, exceptionally strongly constructed vessel, with large holds and extra large hatches, and can easily take through these hatches and into No. 2 and No. 3 holes the cars and locomotives which have got to go to the Isthmus. She can carry, exclusive of her coal, 5,400 tons, allowing 1,100 tons of coal in her bunkers. She has a first-class refrigerating plant, with a capacity of 50 tons in her refrigerator; also the necessary apparatus for making ice, sufficient to supply the requirements of the ship. Her twin screws are manganese bronze and the diameter of her shafts is 2 inches more than the specifications require. In respect to her engines and boilers, electric-light dynamos, and auxiliary engine-room machinery (such as pumps, condensers, fans, etc.), the official of the British corporation who was with me said that he considered all of her machinery exceptionally good, and all from the best makers, and, if anything, heavier than is ordinarily put in a ship of the same size.

In respect to coaling this ship I wish to note that she has two coal ports on each side, so that coal may be discharged by chute through the side and directly into the bunkers, a feature not generally found in British ships.

The ship was designed to be turned into an army transport on short notice, and provision has been made on her upper deck for the care of 1,000 troops, and she is well supplied with the necessary bath rooms, lavatories, etc. Her steering gear is of the strongest kind. It is steam gear and so arranged aft that the hand gear, which is inclosed in a steel house, can be connected in a minute's time.

In respect to handling cargo, the vessel has four large cargo booms at each mast, and exceptionally good and large steam winches (four at each mast) for the hoisting work. In fact in every respect as to the hull, size of frames, plating, beams, machinery, steering gear, cargo gear, chains and anchors, the great strength of the vessel is apparent. She is not a handsome boat from the American point of view, but there is no question but that she will carry a big cargo and stand the test of the worst weather she will ever encounter.

As to her speed and coal consumption, the builders will guarantee her to do 15 knots loaded with 4,400 tons and maintain that speed on a six-hour trial trip, using what is called here, North Country coal. In regular work, day after day, fully loaded, and without driving they say she will do $13\frac{1}{4}$ knots, burning about 75 tons a day of Welsh coal, which coal, they say, is about the same as the coal we are using in our steamers. Basing their opinion upon the performances of three other vessels built by them of a similar type, with the same kind of machinery, and using the same kind of coal, the builders tell me they would almost guarantee that after the ship has got her bearings she will do 14 knots regular.

In respect to the passenger accommodations, the ship is not as good as she is in all other features. Like all English vessels her passenger accommodations are amidships. As you will see by reference to the

blueprint, she is well supplied with bathrooms, lavatories, etc. These are all right. Her main saloon is finished in oak, with the upper parts of the sides and the ceiling enamel white touched out with gold. It is a very large, well-lit compartment. The drawing-room and smoking room on the deck above are well fitted, comfortable quarters; the former is finished with a piano, library, etc. The features which I do not like are the staterooms, the captain's quarters, and the absence of a wheelhouse abaft the bridge.

You will see by reference to the blueprint that the staterooms are rather small. Each room contains two berths of white enamel iron, brass finishings, the upper ones made so as to turn up and fasten against the side of the ship. Each stateroom also contains a folding wash basin similar to those on the White Star ships, and also a sofa. The entire finish of the staterooms is white enamel, but the construction is cheap and not at all up to the style and finish of the Ward Line boats. When I spoke of these things to the builders they paid little attention at first, but subsequently asked me what changes would make the vessel more desirable, and when I told them they said that if that only stood in the way of a sale they would make such changes as I suggested.

These changes, briefly, comprise the construction abaft the bridge of a suitable wheelhouse to shelter the helmsman and also any officers whose duty calls them to the bridge; putting a lavatory and bath in the captain's quarters; the changing of the three groups of staterooms on both sides of the ship just abaft the main saloon so as to make 2 staterooms only where there are now 3. This change would give 12 large staterooms in place of the present 18 small ones. With these changes I believe that the ship would well answer the requirements of our company.

The company asks for the vessel, completely equipped for sea in every respect (I have read over the specifications of equipment and they are most complete in all details), and subject to a trial trip, £110,000. The ship has got to be docked, whenever sold, to give her a final coat of paint and to have her top sides painted as well. The builders would make the alterations in the passenger accommodations which I have recited. At the price they ask she would appear to be a big bargain, compared with the cost of a similar ship from American yards, especially in view of the fact that she can be had within two weeks, if the company should decide to purchase her. I believe, however, that if the builders were offered £100,000, flat cash, they would accept it rather than hold the boat for another purchaser, although to-day an agent of the Russian Government made an inquiry for the ship.

I omitted to mention that the ship is supplied with large steel lifeboats, a full complement of sails and storm sails, awnings, hawsers, and mooring gear; that her decks and rails are all teak, and that her propeller shafts are covered into the hull of the ship instead of being held by struts and a collar. Of course, you appreciate the former method is much stronger as well as more expensive.

The vessels which appear next to meet the requirements of the company are the steamships *Byron* and *Tennyson*, sister ships. A description of one covers the other.

These vessels were built in 1900 and will carry 4,000 tons of cargo, exclusive of bunkering. They are 371 feet long, 45 feet beam, and

draw 23½ feet of water. They are single-screw boats and their logs show an average sea speed of 13½ knots on a coal consumption of about 48 tons a day. They have good passenger accommodations for 70 first class and 24 second class, but the latter could well be used for first-class passengers. Both vessels are classed "100 A1" at Lloyds. The hatches of these vessels are somewhat smaller than those of the Newcastle ship, the largest one being 23.5 by 13.4 and the others averaging 18½ by 11.4. The holds are not so deep, and I doubt if we could put into them the largest pieces of freight which have to go to the Isthmus.

Neither vessel has any refrigerating apparatus. Both of them, however, from the specifications shown me here, are strongly constructed ships, boilers and engines first-class, with exceptionally good passenger accommodations—better than our own ships in this respect, and much better finished than are the passenger accommodations of the Newcastle ship. Their cargo-handling facilities are ample, and in all respects both vessels would be better adapted to the requirement of the company—more economical to operate, would carry a larger amount of freight than any of the ships which we now operate, either those belonging to the company or under charter. The only objection of importance is the inability to put steel cars and locomotives aboard them. It might be possible, however, to put a few cars into the No. 2 hold, which is the largest in the ship. These vessels at present are plying between New York and the Rio. One sails from New York on June 5 and the other one will be in New York about June 25.

If the company desired to purchase one or both, they could be delivered at New York in from ten to twelve days after their arrival at that port, which would mean delivery of one of them about the 5th of July and the other one about the 25th of July.

The price asked for both steamers was £160,000, but yesterday the owners indicated to me that they would accept cash for the two ships, delivered in their present condition (physically they are all right, needing only a cleaning and painting outside), £150,000. I inclose you herewith photos and memoranda of these vessels. You will see by these that these ships, as in the case of the Newcastle ship, have their passenger accommodations amidships; also that they are somewhat handsomer looking than the other one, although the other ship is, of course, a much greater carrier and a faster vessel.

Two more vessels out of the many submitted are worth consideration. These are the steamships *Leopoldville* and *Zungeru*. These vessels are both alike; one year old, and will carry about 3,800 tons, exclusive of bunkers. The *Zungeru* I saw at Liverpool, where she was just sailing for South Africa. The *Leopoldville* is due at Southampton on the 25th instant, and, after discharging, would be available if desired. The owners were to furnish me with a blueprint plan of the ship, but up to the hour of mailing this letter it has not reached me. I may say, however, that in general appearance these vessels resemble the larger vessel at Newcastle, but, of course, considerably smaller. As you will see by the memoranda which I inclose in respect to these ships, their speed is given at 13½ knots on a coal consumption of 55 tons a day. They have accommodations for 83 passengers first class and 64 second.

So far as construction goes and equipment of machinery, both for propelling the ship and for handling cargo, these vessels meet every

requirement. Their hatches, as you will observe, are not over large, judged by our ships, but their No. 2 hold is a pretty large compartment and I think would carry some pretty big pieces of machinery. These vessels have twin screws with bronze blades, and all of their auxiliary machinery is of the most up-to-date character. They are supplied with refrigerating plant, but the capacity of each ship in this respect is limited to about 20 tons; simply enough to take care of the requirements of the ship itself on board. While the price asked for these vessels is £90,000 each, and every time that I have suggested a lower price I have received emphatic refusal to consider the same; nevertheless, I believe that £85,000 cash offer would get the vessel.

I have named the vessels herein submitted to you in the order which they appear to relatively meet the requirements of the company.

Out of all that have been offered these five seem best suited to the New York-Colon business. Three boats have also been submitted for charter by the Atlantic Transport Company, and I send you herewith inclosed a memorandum in respect to their size, passenger accommodations, etc., together with the price asked. In respect to the latter, the term "Government form" as used here means with full crew aboard, so that for the price quoted you would get ship and crew, but even so it seems a great deal of money to pay for these ships. While the memorandum which I send does not so state, each vessel is supplied with refrigerating capacity for about 1,500 tons. One of these vessels—the *Menominee*—is here at London, where I have seen her. She appears almost too large for the service, but of course has large carrying capacity, with a speed about the same as the steamers we are now operating.

I have not been able to obtain any satisfactory quotations for chartering the steamers *Byron*, *Tennyson*, *Leopoldville*, and *Zungeru* from their respective owners. Representatives of the Russian Government are here talking with owners and brokers in respect to chartering vessels of the type of the ones above mentioned and the result is that vessel owners at the present time have very high ideas in respect to charter prices. The Union-Castle Line have two boats which would suit the company quite well if they could be chartered at a reasonable price, but this company refuses absolutely to charter its vessels and the vessels which it would be desirable to charter are too old to buy.

I would say, in conclusion, that I have thoroughly investigated every vessel which it appeared might possibly meet the requirements of the company, and in so doing have covered every principal ship building and shipping port of Great Britain. Several German vessels and one French vessel have been submitted, but they are all too large and too expensive for your requirements.

The vessels which I herein submit for your consideration I have fully looked into, both through Lloyds and the British corporation, and feel satisfied that each and all will prove as represented.

I shall await further instructions from the company after consideration has been given to this report.

Very truly,

R. L. FARNHAM.

LONDON, June 4, 1905.

PANRAILCO, New York:

Per *Lucania* mailed important letters to-day concerning steamships. Believe have found what will be satisfactory. Suggest you arrange with president board of directors for prompt consideration upon receipt of letter. Desirable under the circumstances decision of the board should be sent me as quickly as possible by cable.

FARNHAM.

LONDON, June 11, 1905.

PANRAILCO, New York:

In reply to your telegram and as a supplement to my letter, the Newcastle ship and *Byron* and *Tennyson* can not be chartered. *Leopoldville* and *Zangeru*--I send a full description by letter--can be chartered at the rate of £3,250 each. Other vessels--too old to buy, but do for present requirements--which can be chartered are as follows (dimensions are in Shipping Record): *Arundle Castle*, 4,000 tons cargo; passengers, 75 first class, 50 second; 13 knots on 52 tons coal; price, £2,750. *Cambroman*, 4,200 tons cargo; passengers, 72 first class, 78 second; 13 knots on 70 tons; £2,836. *Vancouver*, 4,000 tons cargo; passengers, 128 first class, 57 second; 13 knots on 75 tons; £2,646.

Atlantic transport boats are too large Panrailco's profitable use. All charter prices quoted are payable monthly. Vessel will be delivered here on British Government form, whereby owner provides complete crew, feeds same, and insures ship; you provide coal and pay port dues. Think above charter prices are too high. Cause is generally believed to be Eastern war. Many steamships--much passenger and little cargo space--charter or sale cheap. Very few ships right proportion of combination Panrailco wants.

FARNHAM.

LONDON, June 14, 1905.

PANRAILCO, New York:

Newcastle people absolutely decline to give us refusal at £100,000. Have indicated they will accept £108,000, equal to \$527,000. Believe if authorize me to make bid up to this amount think this price can probably be reduced a little, but can not get refusal steamer at less.

FARNHAM.

LONDON, June 15, 1905.

PANRAILCO, New York:

Newcastle firm absolutely decline offer. Say ship cost more. *Byron Tennyson* owners have fixed price two vessels £155,000. Prefer not selling singly. I think advisable to try offer £80,000 one only, delivery beginning July. Presence other purchasers prevents getting written refusal from all owners except on firm offer from us. Personally think Newcastle ship better value take everything into consideration, even at £108,000 sterling.

FARNHAM.

LONDON, *June 16, 1905.*PANRAILCO, *New York:*

In order that you are to understand situation, there are not many vessels that meet all requirements Panrailco in respect to age, ability carry 4,500 to 5,000 cargo exclusive bunkers, size of holds, hatches, cargo handling, a sufficient amount cabin passenger accommodations and upward 13 knots. Other buyers for similar vessels here, and owners will not tie themselves up with option, does not include forfeit and are not certain of sail. If I am able to make firm offer certain sum, can then secure option for a short time if offer is acceptable. Consider *Port Royal* and *Antonio* too small cargo, too slow, too many alterations necessary meet our requirements, and owners here agree with me.

Atlantic Transport ship is too large, too much draft, too much waste unavailable refrigerator space to make vessels economical, and charter price high. *Byron* due now New York. Almost certain can get option *Byron* alone, but if you want to purchase *Byron* and get delivery before she sails another voyage it will be necessary enable me promptly make definite offer owners here. Consider *Byron* good all-round ship Panrailco purposes, good speed on economical fuel, but, considering her age, size, average depreciation and price with same features Newcastle ship, think latter even at their price best of two for Panrailco. *Byron* as handsome and well finished as Newcastle is homely, poorly finished cabins, but latter will take place of two Panrailco's present ships and carry larger pieces. Outside experts hold same views.

FARNHAM.

LONDON, *June 17, 1905.*PANRAILCO, *New York:*

Requirements, instructions, Panrailco fully understood, but no 15-16 knot vessels can be obtained in English, German, or French market, except a few large mail boats, too little cargo and too large passenger capacity; prices upward \$700,000. *Port Kingston* only one can meet all requirements; Panrailco can be bought probably \$900,000; asking \$1,000,000. Therefore submitted all others nearest suitable. Await instructions before proceeding further.

FARNHAM.

LONDON, *June 21, 1905.*PANRAILCO, *New York:*

Regarding *Zungeru*, refer to my letter of June 2. Will not be available until two months. Consider these ships relatively dear in view of cargo capacity.

FARNHAM.

LONDON, *June 22, 1905.*PANRAILCO, *New York:*

After conference to-day Newcastle people I think they would seriously consider offer £105,000, including alterations. If you desire to make further offer, instruct by telegraph. If not, think it is advisable I return quickly and with such complete data all vessels as will enable you to make prompt final decision. Nothing further to be gained remaining here longer. Await telegraphic instructions.

FARNHAM.

LONDON, *June 25, 1905.*PANRAILCO, *New York:*

What do you think of my suggestion to return? Everything has been sent for your consideration that is likely to suit Panrailco under last price of Newcastle ship. What do you desire me to do?

FARNHAM.

NEW YORK, *June 5, 1905.*FARNHAM, *London:*

In every proposal obtain, first, lowest cash price; second, lowest charter rate, with longest possible option purchase.

PANRAILCO.

JUNE 15, 1905.

FARNHAM, *Hotel Cecil, London, W. C.:*

Have you seen steamers *Port Royal* and *Port Antonio*, owned by Elder, Dempster & Co., Liverpool. If so, what's your opinion. If not, investigate and advise.

SHONTS.

JUNE 21, 1905.

FARNHAM, *Hotel Cecil, London:*

Does *Zungern* approximate our requirements.

SHONTS.

JUNE 27, 1905.

FARNHAM, *Credonais, London:*

Approve suggestion your telegrams 22-25 that you return promptly, bringing full data for action here. Advise date sailing.

PANRAILCO.

STATEMENT OF WILLIAM BARCLAY PARSONS.

Senator KITTREDGE. Mr. Parsons, will you state your name and age?

Mr. PARSONS. William Barclay Parsons. My age is 47; at least, I will be 47 next month.

Senator KITTREDGE. Where do you live?

Mr. PARSONS. I live in the city of New York.

Senator KITTREDGE. What is your profession?

Mr. PARSONS. Civil engineer.

Senator KITTREDGE. How long have you followed that occupation?

Mr. PARSONS. Twenty-five years.

Senator KITTREDGE. Will you state very briefly your professional record and experience.

Mr. PARSONS. I graduated from the School of Mines of Columbia University, having previously graduated from Columbia College. Then, after an experience in coal mining and railroad construction, I entered the service of the Erie Railroad, where I was for several years. Then I went to New York and began the practice of my profession as a consulting engineer, and engaged in work in different parts of the United States.

In 1891 I was made deputy chief engineer of the rapid transit commission, and in 1894 chief engineer of the present commission, which office I held until the end of last year, on the completion of the subway.

The present subway in New York was planned and constructed under my direction.

Incidentally to that I was chief engineer of what is known as the American Railway in China, and made surveys for that; I was also advisory engineer to the royal commission on London traffic, a member of the Isthmian Canal Commission, and a member of the Board of Consulting Engineers.

Senator KITTREDGE. You were appointed a member of the Canal Commission about two years ago?

Mr. PARSONS. About two years ago.

Senator KITTREDGE. And you continued in that capacity until last April?

Mr. PARSONS. Until last April—the 1st of April.

Senator KITTREDGE. On what committee of that Commission did you serve?

Mr. PARSONS. I was a member of the committee on engineering and chairman of the executive committee.

Senator KITTREDGE. As a member of the committee on engineering, what attention did you give to the engineering questions presented by the construction of the canal at Panama?

Mr. PARSONS. I gave very close attention to the engineering problems for the year that I served on the Commission, and wrote, with Professor Burr and General Davis, the report of the engineering committee.

Senator KITTREDGE. Do you refer to the report of February a year ago?

Mr. BATES. The report of February a year ago.

Senator KITTREDGE. You were a member of the Board of Consulting Engineers appointed by the President?

Mr. PARSONS. I was.

Senator KITTREDGE. And served in that capacity?

Mr. PARSONS. I did.

Senator KITTREDGE. And signed the majority report?

Mr. PARSONS. I did.

Senator KITTREDGE. In favor of a sea-level canal?

Mr. PARSONS. I did.

Senator KITTREDGE. Have you read the report of the minority members of the Board of Consulting Engineers?

Mr. PARSONS. I have.

Senator KITTREDGE. Have you read the statement of Mr. Stevens, the chief engineer of the present commission?

Mr. PARSONS. I have.

Senator KITTREDGE. What engineering questions are you now generally interested in—what great works?

Mr. PARSONS. I am consulting engineer for the various transportation companies constructing lines in New York—the Interborough Company, the Hudsons companies, the New York and Long Island Railroad Company, building a tunnel beneath the East River; I am drawing the plans for the Cape Cod Ship Canal, and some other works. Those are the principal works.

Senator KITTREDGE. Have you had experience in the work of constructing dams?

Mr. PARSONS. I have. I designed the Sparrows Falls dam across the Hudson River, just above Glens Falls, damming the valley of the Hudson with a length of 2,500 feet and a height of 100 feet above the bottom of the river, and excavated to a depth of 60 feet below the bottom of the river, making a total height of dam of about 150 feet, all of masonry.

Senator KITTREDGE. When was that work performed?

Mr. PARSONS. That work was finished about two years ago.

Senator KITTREDGE. Now, Mr. Chairman, I think that the proper foundation for the witness to testify has been laid.

The CHAIRMAN. Yes, and I think it would perhaps be better for Mr. Parsons to give us now his views of the minority report in this case. I will ask you to go on, Mr. Parsons, and give us your views generally of the report of the minority. We of course know your views in regard to the majority report, and if you would be kind enough to give us, in a general way, your views of the minority report we will be glad to hear them. You are familiar with it, of course. If you have not a copy we will furnish you one, and you can have it before you.

Senator KITTREDGE. Before you begin, Mr. Parsons, I would like to call your attention in that connection to a statement made by Mr. Bates on Saturday, as I recollect, to the effect that while the report of the minority gives the usable dimensions of the locks at Gatun as 900 feet by 95 feet, in fact they are less than 800 feet—790 feet, as I recollect the exact distance. I would like to call your attention to that statement and ask you, during your statement, to comment upon that, if you will.

Senator MORGAN. The statement is printed. You had better get the exact terms of it.

The CHAIRMAN. Mr. Parsons has it before him, I think.

Mr. PARSONS. The testimony of Mr. Bates to which you have referred, Senator, is the last testimony that I have received from the committee, and I noticed the statement. You will find it on page 1639.

Senator KITTREDGE. Will you not please read the statement? I may have inaccurately quoted it.

Mr. PARSONS. Mr. Bates, reading from his written statement, stated as follows:

“The minority’s dangerously conjoined three Gatun locks are stated to have usable lengths of 900 feet. These lock lengths are 790, 790,

and 820 feet on the official plans they have themselves put out, and which are indorsed by the Commission and the Secretary of War."

Mr. Bates then proceeded, apparently from the testimony, to show to the committee a model or plan that he had prepared, showing the largest Cunarder (a vessel which is now actually in construction) placed in one of these locks, showing that it would be practically impossible to take that ship in the lock.

I will answer that question, Senator, in the course of my remarks.

The CHAIRMAN. The pamphlet handed you just now is Mr. Bates's testimony of yesterday. You have it all now.

Mr. PARSONS. Thank you very much, Senator. This, of course, I have not seen.

The CHAIRMAN. Yes; the other you have. That was the testimony of Saturday.

Mr. PARSONS. Saturday's testimony I had seen. Yesterday's testimony, of course, I had not seen.

The minority plan, as the committee is aware, Senator, describes a canal with a summit level at 85 feet above mean sea level, reached by a flight of three locks on the Atlantic side, the three locks being placed in flight at Gatun; and reached from the Pacific side by two sets of locks, two locks in flight on the Pacific shore near Sosa and one at Pedro Miguel.

The plan that the minority has submitted is, in my judgment, a feasible scheme. It can be constructed; it can be constructed probably within the limit of cost and time that the minority has set forth. If it was to be regarded as simply a commercial enterprise by a private corporation that would have to go into the open market and risk its capital and pay for that capital 5 or 6 or possibly 4 per cent, when commissions and discounts are taken into consideration, and then expect to make a profit over and above that 5 or 6 per cent, I should say that the plan as prepared by the minority would be a perfectly satisfactory plan. It probably represents the least cost at which a canal can be constructed across the Isthmus of Panama. But that is not the case that was presented to you. This is not a canal to be built by a private corporation; it is a canal to be built by the United States Government.

The United States Government, in the first place, instead of having to pay 5 or 6 or more per cent for its money, can borrow it at, say, 2 per cent. The fixed charges are, therefore, reduced to one-third.

Second, the United States Government seeks for no profit.

Third, the United States Government is looking not only to the safety of the vessels, but to the safety of the canal itself. It must be a canal in which not only the accidents to the vessels are reduced to the minimum, but in which the accidents to the canal itself are reduced to the minimum, so that this canal can be used not only in the ordinary course of commerce, but used in the extraordinary circumstance of war; and, in my judgment, the plan as proposed by the minority does not meet those requirements.

The locks themselves are a source of danger in operation. They are a source of delay in operation. They present vulnerable points for attack in case of war, and they make a canal that is practically inelastic. In other words, that can not be increased in usable dimensions except at a very great cost.

That, in a few words, is my criticism of the minority report.

The CHAIRMAN. Would not the same thing apply to both types of canal if you wanted to change it? Either one of them could be changed only at great cost, could it not?

Mr. PARSONS. No; because the sea-level canal is a canal that would not have to be changed. It is the ultimate development. You have gotten down then to the lowest possible point; you can not go any farther.

The CHAIRMAN. You think the plan as submitted by the majority would require no change?

Mr. PARSONS. The plan submitted by the majority would require no change. If at any time the demands of commerce or the growth of ships became so great that a larger canal (which would be merely a wider canal) would be required, the canal of course could be widened gradually and without interference with traffic, exactly as they are now doing with the Suez Canal. Of course you must remember, however, that the Suez Canal, even after being widened and deepened, will not have the dimensions, either as to width or depth, that have been proposed by the majority for the canal at Panama.

Senator DRYDEN. Do you consider that the flights of locks as provided by the minority are dangerous or impracticable?

Mr. PARSONS. I consider them exceedingly dangerous, Senator.

Senator DRYDEN. You think that the machinery is liable to get out of order so that there will be difficulty in operating the locks?

Mr. PARSONS. It is not merely the question of machinery; it is the question of human fallibility. Take the Manchester Canal, for instance. There have been three cases in the history of that canal where vessels have actually gone through a lock.

Senator DRYDEN. Gone through? You mean where they have broken it down?

Mr. PARSONS. They have broken it right down—charged and gone through; and the day will come at Gatun—it may not come the first year, it may not come for ten years, it may not come for twenty years, but that it will come I do not think there is the slightest doubt—when some steamer will go plunging down that ladder.

Senator DRYDEN. And the effect of that would be to put the locks out of business for a long time?

Mr. PARSONS. The effect of that would be to put the canal out of business for a period of anywhere from one to five years. In other words, you would have to rebuild the locks; you would have to refill the lake; you would have to reconstruct the channel below the locks, to say nothing of the damage that would result from such an accident.

Senator DRYDEN. I understood you to say that such an accident would delay the use of the canal for from three to five years, possibly?

Mr. PARSONS. Probably. You would have to reconstruct the canal.

To show you how those accidents occur in spite of care, one of the accidents that happened in the Manchester Canal—

Senator MORGAN. That is one of the two you mentioned?

Mr. PARSONS. That is one of the three I mentioned, Senator—one of those accidents was where a vessel was approaching a lock with a strong gale astern. The pilot on the bridge rang, as usual, to stop. He supposed he had allowed enough for the gale. He found that the gale was pushing him into the lock a little faster than he had allowed for, so he rang to the engine room to back. He found that the engine

room was not backing hard enough, so he rang a third time, "Astern full speed."

Now, the man in the engine room, not knowing what was taking place on top, looked for the natural sequence of orders—first to stop, then to back, which frequently happens. Then, having backed, and believing that his ship was going astern, he looked the next time for an order to go ahead. His bell rang, and, as he expected, the indicator was "Half speed ahead." So he gave his vessel half speed ahead. The pilot on the bridge, realizing that the vessel was going ahead instead of going astern, rang again "Full speed astern." The vessel did not stop its speed, and went plunging through the gates. The wire leading from the bridge to the engine room had parted at the critical moment of the third signal, and instead of indicating in the engine room "Full speed astern," it indicated "Half speed ahead," and the ship went plunging through the gates.

In that particular case, as in the other two cases——

Senator MORGAN. What was the result?

Mr. PARSONS. I was just going to give that, Senator. In that case, as in the other two cases, the attendants on the shore, seeing that the vessel was going to strike the lower gates and was bound to go through, stood ready and started to close the gates just as the stern of the vessel passed the upper gates. The rush of water as the vessel carried away the lower gates brought the two upper gates together with a bang, sufficient to wreck the gates, but not sufficient to tear them away; so that the gates, fortunately for the lower regions of the canal, held back the water in the upper level. The lock itself was out of service for something like a month, while new gates were being put in place.

In that case the gates had a lift of some 13 feet only, and a width of lock of about 70 feet. In the case in question, with gates lifting 30 odd feet and with a width of 95 feet, with the corresponding increase in weight of gate and enormously increased pressure of water, it is practically certain that no gate could be built that could be operated under ordinary conditions that would stand the bang of those gates coming together.

Senator MORGAN. Mr. Parsons, did I understand you to say that a gale was blowing at the time?

Mr. PARSONS. A gale was blowing at the time.

Senator MORGAN. Let me ask you, right there—the dam at Gatun would be about how far from the shore?

Mr. PARSONS. Five or 6 miles.

Senator MORGAN. How far from the shore of Panama Bay would the lock gate be?

Mr. PARSONS. Right at the shore, on either plan—either the sea-level plan or the other plan.

Senator MORGAN. In the case of a gale blowing home on either of those waters, would there not be very serious danger of breaking down the locks in one case, the case of the Bay of Limon, and breaking down the lock gate in the other case?

Mr. PARSONS. I think there is always a danger of breaking down a lock gate.

Senator MORGAN. Now, if you add to a gale some uplift of the sea, such as has frequently occurred on the Pacific coast there by what we call a tidal wave, caused by an earthquake or volcanic action, or whatever the action may be that causes it, we do not quite know, would

not that endanger the lock gate on the Panama side and also the canal itself? If a tide should be blown in by a gale, and also uplifted by some volcanic or seismic disturbance at the same time, would there not necessarily be a very hazardous and very destructive operation upon the canal and the lock gates?

Mr. PARSONS. The lock gates, of course, would be built sufficiently high to cover any known or probable contingency that would arise at Panama, so that they would be above the level of water in any possible case. But suppose that you got an extraordinary tide from some volcanic action in the Pacific Ocean, and a tidal wave came along that coast. The result would simply be that the gates would be topped, would be drowned out, and the back country flooded; and when the tide went down your conditions would become normal again, except so far as the City of Panama was concerned. It, of course, would be washed out.

Senator MORGAN. Those contingencies are among the possibilities of the situation.

Mr. PARSONS. Those contingencies, of course, are among the possibilities of any situation.

Senator MORGAN. Except on the top of a mountain? You would not expect the sea to invade the top of a mountain?

Mr. PARSONS. No; but I mean on the ocean shore.

Senator MORGAN. On the ocean shore?

Mr. PARSONS. You are liable, of course, to get a tidal wave such as they had at Lisbon a great many years ago, or on the Chilean coast a great many years ago; there was a tidal wave there.

Senator MORGAN. I understand from the hydrographic surveys that the "northwesters," as they are called down there, blow home in the Bay of Limon frequently, annually?

Mr. PARSONS. They do.

Senator MORGAN. And sometimes very heavy seas roll in there, caused by atmospheric disturbances two and three hundred miles away from the coast?

Mr. PARSONS. They do.

Senator MORGAN. Those have to be taken into consideration in locating locks in the canal within reach of their influence, do they not?

Mr. PARSONS. They do.

Senator MORGAN. Just as on the other side the seismic disturbances and the gales that may blow into the Bay of Panama have to be considered? Both sides have to be protected?

Mr. PARSONS. Both sides have to be taken care of.

Senator MORGAN. They are matters that we have to consider in establishing a canal if we expect it to be a permanent establishment?

Mr. PARSONS. I think that the Limon Bay situation has been taken care of by the jetties that have been proposed.

Senator MORGAN. You think that is sufficient?

Mr. PARSONS. I believe that is sufficient. I have seen, myself, Senator, one of those gales rolling in there.

The report of the Isthmian Canal Commission, or the Walker Commission, as it was called (that is, the Commission previous to the present Commission), that was sent down there to examine and report, and that reported in favor of an 85-foot level, made no provision for any protection in Limon Bay. I believe that the first real calling attention to the needs of protection at Limon Bay was made by the report

of the engineering committee of the present Commission before it was reorganized—the report of February, 1905, in which Professor Burr and General Davis and myself advised the protection of the approach to the canal in Limon Bay.

As laid out by the French, and as approved by the Walker Commission, the entrance to the canal came in from the open, as you can see on that map, and then turned around the point of Colon, and then entered the canal itself back of that point. While Professor Burr and I were with General Davis on the Isthmus in January and February a year ago, one of the periodic “northers” came along, and we started at once for Colon to see its effects. It was the most severe gale they had had, I think, in some three years. It was so severe that every steamer in the port of Colon went to sea for safety. It was impossible for a vessel to lie in the harbor of Colon, and the steamers went to sea and did not come back for some four or five days. They went up the coast and into the harbor of Porto Bello and took refuge there, and waited for the storm to blow out.

The seas were rolling so high in Limon Bay at that time that it would have been practically impossible for any vessel to have entered the canal, or still more so for any vessel to have doubled Colon Point and made the right-angle turn there and gone into the canal. In coming broadside on to the wind, as she would have done, her stern would undoubtedly have swung off, so that she would have gone ashore on one side of the canal channel or the other, for that would have to be a dredged channel at that point.

We determined then that it would be unsafe to follow the French plans or the plans of the Walker Commission and leave Limon Bay unprotected, and we therefore recommended that a system of breakwaters be established. That recommendation was developed by the Board of Consulting Engineers, and both the majority and the minority agreed substantially on the same lines of protection.

Senator MORGAN. And that they are sufficient?

Mr. PARSONS. And that they are sufficient.

Senator MORGAN. Now, I want to make a little comparison. Have you ever been at Port Said?

Mr. PARSONS. Never.

Senator MORGAN. Or Suez?

Mr. PARSONS. No; I regret that I have not.

Senator MORGAN. You have studied the question of the protection that is given there, however?

Mr. PARSONS. I have, sir.

Senator MORGAN. At Port Said has the protection been sufficient at all times?

Mr. PARSONS. I understand that it has been.

Senator MORGAN. And yet they have heavy storms in the Mediterranean?

Mr. PARSONS. They have very heavy storms in the Mediterranean.

Senator MORGAN. Very heavy. They also have heavy storms in the Red Sea?

Mr. PARSONS. They have.

Senator MORGAN. But the protection given at Suez and also at Port Said has been found to be sufficient?

Mr. PARSONS. It has.

Senator MORGAN. At all times?

Mr. PARSONS. And the protection that is proposed by the Board of Consulting Engineers, practically unanimously, for Limon Bay was developed with the aid of Mr. Quellenec, the consulting engineer of the Suez company, in the light of their experience at that point.

Senator MORGAN. Have the majority of the Consulting Board arranged any breakwater or any system of protection against these incoming storms and seas on the Panama side?

Mr. PARSONS. Nature has done that. The chain of islands that you can see on this map protects the mouth of the canal. There has been no storm known there since the Isthmus has been used as a means of transit that has made it impossible for vessels to lie there.

Senator MORGAN. And that chain of islands protects it sufficiently?

Mr. PARSONS. It protects it sufficiently.

Senator MORGAN. Both the anchorage outside of or in the midst of those islands, and the entrance to the canal?

Mr. PARSONS. And the entrance to the canal. Those islands practically form a breakwater in case of a storm in the Pacific, and storms are very rare on the Panama side. In fact, in that latitude the big storms come from the north, so that the Isthmus itself breaks the storms on the Panama side. At the time of this storm that I am referring to the Pacific Ocean was quite calm. There was no storm on the Pacific side, and we did not really appreciate the storm until after we got over the top of the divide.

Senator MORGAN. So that you consider the situation on the Panama side as being practically sufficient to guard the vessels at anchor and also the inlet to the canal?

Mr. PARSONS. I do.

Senator MORGAN. That is all I want to ask you upon that point.

Mr. PARSONS. Now, if I may answer Senator Kittredge's question in regard to the locks at Gatun, I think I can explain Mr. Bates's criticism.

This sheet that I lay before you is Plate XI of the report of the Board of Consulting Engineers, in which you will see the Gatun dam and the three locks in flight.

Senator MORGAN. Before you leave that matter, there is just one thing that I want to ask you that escaped me in this examination. Do you think it is practically safe to enter the Bay of Colon, we will call it, in times of storm at sea, and turn that curve that you describe as a right angle, and come into the interior bay at Colon?

Mr. PARSONS. In there [indicating]?

Senator MORGAN. Yes.

Mr. PARSONS. I think it would be. I think it would be, because any sea that comes rolling past the mouth of the breakwaters, coming in, as you will see by the map, into a bell mouth, would be sufficiently dissipated by the time it got to Cristobal Colon Point to permit a vessel to double that point if it wanted to.

Senator MORGAN. That breakwater there extends to the 40-foot contour?

Mr. PARSONS. That goes out to 40 feet of water.

Senator MORGAN. Yes; out to 40 feet of water. Is it 40 feet?

Mr. PARSONS. It is 42 feet, as a matter of fact, I think. I think it goes out to the 7-fathom line.

Senator MORGAN. Does the breakwater, as projected by the majority of the Board of Consulting Engineers, afford protection also to the Bay of Colon?

Mr. PARSONS. Yes; because here is the roadstead where the vessels anchor. Here, as you see by the map, are the piers of Colon; and it would be along on the shore and in behind Cristobal Colon Point that the business would be done.

Senator MORGAN. So that in the event of opening the canal into the bay of Limon, 4 or 5 miles farther down the coast than Colon, we would by that breakwater also protect to a considerable degree the Bay of Colon, so that it could be kept open for the benefit of Panama and for mercantile resort?

Mr. PARSONS. It could be; in fact, you would make it a port.

Senator MORGAN. Yes.

Mr. PARSONS. You would make it a port. It is not a real port to-day, because, under certain conditions of weather, such as I have just described (which I myself have seen), a vessel can not lie there. There were five steamers in port at the time; and, as I said, all five had to go to sea. They could not stay in there. They had to go to sea for safety.

Senator MORGAN. That answers all the questions I wanted to ask.

Senator DRYDEN. Did not Mr. Bates criticise the situation there with regard to the depth of the water and also the projecting rocks underneath the water?

Mr. PARSONS. Mr. Bates preferred his own method of making a harbor, which was to wholly abandon Colon and build a new city back on the shore here, the south shore of Limon Bay, and put in a breakwater, and then construct a new harbor inland by large excavation.

Senator DRYDEN. He did not approve the arrangement of the breakwaters as proposed by both the majority and the minority engineers?

Mr. PARSONS. He did not.

Senator DRYDEN. You still, of course, adhere to your views on that point?

Mr. PARSONS. The board was quite unanimous on that point.

To answer Senator Kittredge's question, as I said a moment ago, I lay on the table Plate XI of the report of the consulting engineers, showing the Gatun dam and the series of three locks; these locks being included between the three shaded lines here, which represent the outer walls and the inner wall separating the twin locks.

When the advocates of the lock canal brought forward a scheme of locks in flight, it was opposed by the majority members of the board on the score of safety. It was said that a vessel might come through there, and if she happened to carry away the upper gates—did not stop at the upper gates—she would undoubtedly go right down through the succeeding locks and carry the whole thing away, drain off the lake, and destroy the canal from Gatun into the sea.

Senator KITTREDGE. That would entirely destroy the canal as far as use was concerned?

Mr. PARSONS. As far as use was concerned the whole canal, of course, would be out of service until the new gates could be restored here and Gatun Lake refilled. The filling of that lake would take something over a year.

The advocates of the lock canal met that point by stating that they could put in some special kind of a gate that could be closed in case of an emergency, as was actually done at Manchester. The objection to that was, of course, that any emergency machinery is liable to get out of order; any machinery which is called into use once in ten or

fifteen or twenty years, or longer, is almost certain not to be ready when it is called for.

Senator KITTREDGE. What about this emergency machinery? Was any particular type suggested?

Mr. PARSONS. No. They said that some sort of a gate could be devised that could be quickly floated into place and that would be sufficiently strong to stand the great shock of closing with a bang.

Senator KITTREDGE. Were any suggestions made as to the possibility of constructing machinery of that sort?

Mr. PARSONS. As you will see here in a moment, they did not propose it in detail. Nothing of that sort has ever been done—to close a gate with any such head as that.

The minority came to the conclusion that the best thing to do would be to install double gates at each one of these locks, and have two gates always open in front of a ship and close behind it, so that the emergency machinery would be put into service every time a vessel went through, which, of course, is a much safer procedure. It would involve, possibly, a slight delay in opening and closing the gates, as two sets of gates would have to be opened, but that, I think, would be a negligible quantity.

Their argument was that if a vessel came down under way and struck the upper gates she would carry away the first gates, but that she would still have in front of her a second pair of gates, which, under any ordinarily conceivable condition of affairs, unless the vessel was going at a great speed, would probably be sufficient to arrest her. They therefore proposed to put in duplicate gates in each of these locks, and not to put in the special gate that I have just referred to, which has never been designed. So that they have introduced, as you can see here, in this triple flight, and also at their other locks, a second set of gates.

If you will scale off the distance from this map, you will find that they have got the 900 feet in the clear between the outer gates, but only 790 feet in the clear between the inner gates.

Senator KITTREDGE. You mean by "the outer gates" the lower gate at the lower lock and the upper gate at the upper lock?

Mr. PARSONS. They double the gates all the way through, at each lock.

Senator KITTREDGE. And have they accounted for that doubling?

Mr. PARSONS. They have accounted for it simply in that way—by subtracting it from the effective length of the lock. In other words, if the double gates are to be used, then the lock has an effective length of something less than 800 feet. If the double gates are not to be used, then they get an effective length of lock of 900 feet, as they have planned.

Senator KITTREDGE. What is the length of the largest ship now being constructed?

Mr. PARSONS. Seven hundred and eighty-eight feet, I think—one of the Cunarders.

Senator KITTREDGE. Could that ship go through this lock?

Mr. PARSONS. It could not, unless they left the safety gates off. Then, of course, the criticism comes right back to where the majority members of the board opposed the lock scheme—that there is no safety device against a vessel plunging through.

Senator KITTREDGE. Did they agree with you that the safety gate should be put in the construction?

Mr. PARSONS. Apparently; they put it in. You see, Senator, the minority report was written after the majority report was written, so that the majority members had no chance to in any way reply to the minority report. The majority of the board prepared its report, then that was submitted to the dissenting members and the minority report was written. The members signing the majority report simply saw it at the last session, when the board met to adjourn sine die.

Senator KITTREDGE. Would the safety gates that you have spoken of prevent the ship plunging down through the lock as you have stated?

Mr. PARSONS. I think they probably would. I think that if two gates were there, under ordinary conditions, with a vessel approaching at, say, 5 or 6 miles an hour, probably the second gates would be sufficient to hold her.

Senator KITTREDGE. You say "probably;" are you able to say that they certainly would?

Mr. PARSONS. If you take a large ship, moving even at a slow rate. 5 or 6 miles an hour, her momentum is so great that it is very difficult to say what she would not do.

Some few years ago when one of the French liners, I think, was clearing from New York, the pilot made a mistake and thought she was going to clear the end of a pier. The ship was moving at a very slow speed, but she cut halfway through one of those big piers before she was stopped. So that in the case of a big steamer having, besides her own weight, 8,000 or 10,000 or 15,000 tons of cargo, what she would do under a given speed would be very hard to tell. Of course when she is stopped it would be a different thing.

Senator KITTREDGE. Then, in your judgment, the danger of crushing down through those locks is always present?

Mr. PARSONS. I do not think there is any doubt about it. That is my criticism of a lock canal.

Senator KITTREDGE. You mean even with the safety gates added?

Mr. PARSONS. Even with the safety gates added; and, of course, you must always remember in that particular case that with a very large steamer, where the safety gates could not be closed—they would have to be open, because otherwise you could not get her in—you would have no safety device as against the most dangerous type of vessel. The larger the vessel the more difficult she is to handle, and the more difficult she is to stop. Her momentum is greater by reason of her greater weight.

Senator KITTREDGE. Then, as I understand you, notwithstanding the statement in the minority report of the usable dimensions of this dock as 900 feet by 95 feet, in the plan presented to us the usable dimensions are in fact 790 feet as to length?

Mr. PARSONS. That is a fact.

Senator KITTREDGE. By what width?

Mr. PARSONS. Ninety-five feet.

Senator KITTREDGE. Is it not possible to lengthen the entire lock structure so as to have a usable length of 900 feet?

Mr. PARSONS. It is not possible to do that and still keep the three locks in flight.

Senator KITTREDGE. Why is that?

Mr. PARSONS. The topography of the ground, falling off at both

ends, that you could not get a longer structure in there. In fact, Mr. Bates himself pointed out to you in his testimony that even with the locks as designed, the guard wall in the middle would have no foundations on rock. I do not think that Mr. Bates's criticism in that regard has any very large amount of weight, because a wall of that description need not be founded on rock. It is simply for vessels to be guided against, and a pile structure would probably answer quite as well as a structure founded on rock. But the principle involved is true, that if you lengthen these locks the end gates are not going to have a suitable foundation.

Senator KITTREDGE. I wish you would explain that point in detail. I do not quite understand why it can not be lengthened.

Mr. PARSONS. The majority members of the board, and, in fact, all the board except two members, voted at the outset that all locks should have a usable length of 1,000 feet and a width of 100 feet. That question was decided by a vote of, I believe, something like eleven to two; and it was in order to allow not only for the vessels now building but for such increase in size of vessels as could be foreseen. It is quite possible that we shall have, in the course of a few years, vessels 900 feet in length; and a vessel 900 feet in length will need a 1,000-foot lock. So that the board decided, by a vote of eleven to two, without regard to the type of canal, that the locks should have a usable length of 1,000 feet and a width of 100 feet.

When the minority came to prepare their preferred plan, which was to keep the three locks in flight at Gatun in order to diminish the expense of the canal, it was found that three 1,000-foot locks could not be constructed at that site. There is a divide there, a ridge, with suitable material for foundations—rock or a very hard clay, amounting almost to a rock, and at such reasonable depth as to be reached by the locks. But when you came to make the locks of a thousand feet each, with the space between the locks for the gates and the clearances between the locks, the ends of that structure would overhang the sides of this ridge so that the ends would not have a proper foundation. The ends would include, of course, the end-gates at both ends, where it is most important that there should be a satisfactory foundation.

The minority, therefore, decided not to use 1,000-foot locks. In other words, three members of the minority reversed themselves in their original decision of a thousand feet, and dropped back to a 900-foot lock, so as to get in three locks of 900 feet each in this situation.

Then, when an objection was made to the danger of locks in flight, they still further reduced it, as Mr. Bates has pointed out, by introducing the safety gates, the second set of gates, and by putting them inside of the 900-foot length.

Senator KITTREDGE. And thereby reducing the usable length dimension to less than 800 feet?

Mr. PARSONS. To something less than 800 feet.

Senator MORGAN. Mr. Parsons, while you are on the subject of locks, I would like to make an inquiry: Do all of the great canals, the Suez and the Manchester and Kiel, and so on, and the Soo Canal, use the folding gates yet?

Mr. PARSONS. The Suez Canal has no locks.

Senator MORGAN. It has a sea-gate, has it not?

Mr. PARSONS. I think not. They use no gates whatever, no locks at all. At the other canals, the Manchester and the Kiel, they have the ordinary type of folding gates.

Senator MORGAN. They have folding gates, also, at the Soo?

Mr. PARSONS. They have folding gates also at the Soo.

Senator MORGAN. Is there any project on foot among engineers to get a better gate than that?

Mr. PARSONS. Gates have been projected and designed, I believe, for the Soo Canal of different types; but up to date no design has been found to be satisfactory to take the place of the original type of folding gate.

Senator MORGAN. Have you ever examined the rolling gate that was invented by Lieutenant Peary?

Mr. PARSONS. Not in detail; no.

Senator MORGAN. Did you know what his project was—what the outline of it was?

Mr. PARSONS. Yes; I know there have been a number of those rolling gates devised, gates of all sorts of types; but they never have commended themselves sufficiently to the parties in charge of big lock gates to have them adopted.

Senator MORGAN. Of course the gates always open back into the lock?

Mr. PARSONS. That depends on which gate it is. The upper gates, of course, would open away from the lock.

Senator MORGAN. But if they are locks in tandem?

Mr. PARSONS. If they are locks in tandem, then, of course, they would be inside.

Senator MORGAN. In a lock of the width that you describe how many feet wide is it?

Mr. PARSONS. The minority lock was 95 feet wide. The lock preferred by 11 out of the 13 members of the board was 100 feet wide.

Senator MORGAN. That would be 50 feet for each gate. You have to make room for those gates to open and close?

Mr. PARSONS. Certainly.

Senator MORGAN. And you have to add that to the length of the lock?

Mr. PARSONS. You have to add that to the length of the lock.

Senator MORGAN. Is that provided for in this design?

Mr. PARSONS. Yes. When we speak of 900 feet or of 1,000 feet, we always refer to a 900-foot or 1,000-foot (as the case might be) usable length.

Senator MORGAN. That is what is meant by "usable length?"

Mr. PARSONS. That is what is meant by "usable length." The space taken up by the gate, therefore, is not to be deducted. In the case of the safety gates, as I have just explained, in the point raised by Mr. Bates—

Senator MORGAN. I did not undersand exactly what was meant by "usable length," and I wanted to find it out.

Senator DRYDEN. What would happen to a vessel going through there that might smash down those locks, Mr. Parsons?

Mr. PARSONS. In going through three locks?

Senator DRYDEN. Yes; if it smashed the locks down when it was going through, what would be likely to be the fate of that vessel?

Mr. PARSONS. I think that probably the insurance companies would own it.

Senator DRYDEN. You think that the lives and the freight would all be lost?

Mr. PARSONS. I do not think that a vessel would have much value after making a jump of 85 feet in three steps.

Senator MORGAN. The Government would have the expense of the burial, would it?

Mr. PARSONS. The wreck itself might have to be removed somewhere; but I think pretty much everything that was movable would be somewhere out in the Caribbean Sea, Senator.

Senator KITTREDGE. Going back for just a minute to the locks: Suppose that they extend this lock structure to secure a usable dimension of 900 feet in length, the ends of each lock would extend into space or into the air. Is that right?

Mr. PARSONS. They would. You would have to build up to them.

Senator KITTREDGE. Does that expression accurately convey the situation to the mind of a layman?

Mr. PARSONS. I should imagine that it would, Senator.

Senator KITTREDGE. You said something a moment ago about building up in order to make the entrance to these locks. Please explain that.

Mr. PARSONS. You can imagine the cross section of a hill with the flanks of the hill and a curved top. Now, you can make an excavation of a certain length that will be wholly within the hill, or you can also imagine an excavation of a certain length where the ends of the excavation (I am now going to make a "bull") will be outside of the hill, considering the excavation as a trough, for instance. And when you come to lengthen these locks, as Mr. Bates has pointed out, that is exactly the condition that you would strike here at Gatun; in other words, that the hill is not sufficiently long to take in the locks and the lock structure.

Senator KITTREDGE. In accordance with the plan proposed by the minority?

Mr. PARSONS. In accordance with the plan proposed by the minority.

Now, take the locks they themselves have laid out, and you can see here in a moment the great length required. From end to end of their walls is a distance of 5,500 feet. In other words, there is a masonry structure there a mile long, as they plan it out.

Senator KITTREDGE. Is it necessary to have that length of structure?

Mr. PARSONS. Yes.

Senator KITTREDGE. Why?

Mr. PARSONS. The locks themselves, exclusive of the approach walls, cover a distance of 3,000 feet. Then you have the approach guide walls in addition to that, which are planned to be of masonry; so that, according to that plan, you have a structure there over a mile long. Now, then, if the locks are to be lengthened from 790 to 1,000 feet of usable length, you see you are going to add over 600 feet, again, to that. In other words, in that case the total masonry structure would be considerably over 6,000 feet, nearly a mile and a quarter, in length.

Senator KITTREDGE. Where is the entrance of the lock structure with reference to the depot at Gatun—north or south of that point?

Mr. PARSONS. It is almost abreast of it.

Senator KITTREDGE. And then extending to the north?

Mr. PARSONS. And then extending to the north. It is almost abreast of it, and just to the east of it.

Senator KITTREDGE. You spoke a moment ago of building up to this lock if they extended it so that they could have a usable dimension exceeding 790 feet?

Mr. PARSONS. Yes; because, if you will consider the locks themselves as a trough, and then placed in the hill, the ends of that trough would overhang the side of the hill. Therefore you would have to build down from that trough to the rock below in order to get a foundation to support the ends of that trough.

The CHAIRMAN. There is no reason why that can not be done, Mr. Parsons, is there?

Mr. PARSONS. The rock is very far down. It simply adds tremendously to the expense; that is all.

Senator DRYDEN. Can you tell about what would be the height of this support or masonry work, I suppose it would be, required to reach the ends of the locks?

Mr. PARSONS. I think I could this afternoon. I could not give it to you offhand, because I have not worked it out; but I was merely explaining the question that Senator Kittredge asked, in explanation of Mr. Bates's criticism that the locks only had a length of 790 feet and not of 900 feet. I was explaining that that was a fact, and why it came about.

Senator DRYDEN. It becomes a matter of expense, then?

The CHAIRMAN. I could not understand that at all yesterday, but it is perfectly plain now, since I see what Mr. Parsons says.

Senator DRYDEN. It becomes, then, a matter of expense; and, as I understand, Mr. Parsons, these supports could be built?

Mr. PARSONS. Oh, yes.

Senator DRYDEN. But it is a question of expense?

Mr. PARSONS. It is a question of expense.

Senator DRYDEN. I assume that you, not having the distance in mind, have not made any calculation as to what that expense would be?

Mr. PARSONS. I have not. Of course it is not merely a question of building up a block of masonry to carry the gates; but you have to have enough masonry to take up the thrust of those gates. You see the gates themselves act like an arch with the pressure of the water against them, and they have to have abutments; so that it is like carrying an arch away up in the air. You have to build abutments to support that arch, and that is the reason why you have to have such good foundations under your lock gates. If you have no rock except at great depth, and you have to build up to this gate, you have to build up a very heavy abutment in order to support the thrust of the arch of the gates themselves.

Senator DRYDEN. Could you give us an approximate idea as to the cost of building such supports, whether it would be one million dollars or five million dollars, or anything of that kind?

Mr. PARSONS. Oh, offhand, I could not, but it would run into a good many millions of dollars. I think it would be sufficient in itself to condemn the idea of locks in flight at Gatun entirely apart from the question of safety. I think that the expense alone, if those locks were to be made a thousand feet long (as they unquestionably should

be, and as 11 out of the 13 members of the board decided that they should be before any question of type of canal was raised at all), would be sufficient to condemn that plan.

Senator DRYDEN. In short, you consider that the flight of locks at this point would be impracticable as to dimensions which would accommodate the largest ships now in process of construction?

Mr. PARSONS. I think so.

Senator MORGAN. Let me ask you there, please, this question: These lock gates describe an arch against which the pressure comes laterally?

Mr. PARSONS. Certainly.

Senator MORGAN. They have to bear the entire burden of the water that is in the lock, as I understand it, with the superadded burden of the weight of the ship that is in the lock?

Mr. PARSONS. As far as the superadded weight of the burden of the ship is concerned, of course she displaces that same amount of water.

Senator MORGAN. Yes.

Mr. PARSONS. So that it would be the same in either case.

Senator MORGAN. But still it is all confined in the lock chamber?

Mr. PARSONS. It is all confined in the lock.

Senator MORGAN. Now, is it not of the first importance that those gates and the abutments to them should be as strong as or stronger than any other part of that lock?

Mr. PARSONS. That is the weakest part of the lock; and the abutments to those gates must be sufficiently strong to protect those gates from yielding.

Senator MORGAN. And the danger comes, in a lock canal, more from the gates than from the walls on either side?

Mr. PARSONS. Oh, yes.

Senator MORGAN. Or the floor?

Mr. PARSONS. Or the floor.

Senator MORGAN. That is all.

Senator DRYDEN. I would like to ask your opinion as to the relative weaknesses of these two types of canal against the effects of an earthquake. I would be glad if you would point out the weak points of the lock type of canal and compare it with the same matter with regard to the sea-level canal.

Mr. PARSONS. So far as the main structures are concerned, I do not think that there is very much difference. I do not think that there is much to fear from an earthquake for either type of canal, so far as the main structures are concerned.

The lock gates must be nicely adjusted in order to work properly, and I think it is conceivable that an earthquake which would not produce any very great structural damage might be sufficient to distort the adjustment of the gates and their foundations, so that the gates themselves would not work. Of course that is a damage which could be repaired, but it would put the locks out of service while it was being repaired, and that, I think, is the major danger that would be feared from an earthquake for either type of canal.

Senator DRYDEN. I will ask you the same question as applied to the attack of an enemy, say, in case of war.

Mr. PARSONS. In the case of war the locks, of course, are the vulnerable part. One man can carry enough high explosives in his clothes to put a lock out of service, if not to destroy the canal. I am speaking now of a lock canal. Of course in the case of the sea-level

canal the tidal lock could be destroyed in a similar manner; but in that case the canal itself would not be destroyed. The canal would still remain usable even with the tidal lock destroyed, because at least for one-half the time that tidal lock would stand open. Then, the rest of the time, during the period of the month when we get what is known as the spring tides, the extra high tides, there would be two times a day when the level of the water inside and outside would be the same, and a great portion of the day vessels could still enter and leave the canal. So that in the event of the tidal lock being destroyed by high explosive the canal itself would not be destroyed; but in the case of a lock canal the destruction of a lock or locks would of course destroy the canal.

One man can carry enough dynamite in there to destroy a lock. If you say that the locks would be so guarded that strangers could not approach them, it is easily conceivable that an enemy could take a small steamer and load her with dynamite or some other high explosive—a vessel clearing with the ordinary papers, and apparently loaded with bananas and making the voyage in the ordinary commercial way. That vessel would get in the top one of these locks, and while in the process of being locked through the crew would simply jump ashore, and possibly inform the lockmen that that vessel was loaded with nitroglycerine and was going to explode in half a minute. There would be nothing in the world to stop it, you know; and you would always find, in the case of a war, men who would be perfectly willing to take that risk.

Senator DRYDEN. And the destruction of these locks could be made as complete as in the case of a vessel smashing them down, which you have heretofore described?

Mr. PARSONS. Quite.

Senator DRYDEN. And even if the work was uninterrupted, and in time of peace, it would take from three to five years to restore those locks, according to your view?

Mr. PARSONS. Probably.

Senator MORGAN. The plan of the minority, as I understand it, is for a flight of locks at Gatun?

Mr. PARSONS. For a flight of locks at Gatun.

Senator MORGAN. Two locks, one following the other?

Mr. PARSONS. Three.

Senator MORGAN. Does the immediate connection of the three locks together increase the danger to ships navigating that canal, one above the other? Is their immediate connection together? I suppose they are all connected together.

Mr. PARSONS. They are all connected together, so that a vessel goes from one to the other in a succession of steps.

Senator MORGAN. Through the gates?

Mr. PARSONS. Through the gates.

Senator MORGAN. Does the fact of putting three locks together in flight increase the danger of navigation through the locks?

Mr. PARSONS. Yes; because a vessel plunging through the three locks would undoubtedly make a far worse accident than a vessel going through a single lock.

Senator MORGAN. Is there any greater danger of meeting an accident?

Mr. PARSONS. A greater danger of meeting an accident in going through three locks in flight as against three separate locks?

Senator MORGAN. Yes.

Mr. PARSONS. I do not know that there would be. The accident itself would be greater if it occurred.

Senator MORGAN. Yes; the accident would be greater, but you do not think that the exposure to danger would be any greater?

Mr. PARSONS. I do not think so. I do not think a flight of three locks would present any greater danger than three single detached locks. The vessel has to make three movements. The danger, of course, arises when you have your vessel in motion.

Senator MORGAN. That is exactly what I have had in mind. The vessel has to make three movements?

Mr. PARSONS. The vessel has to make three movements.

Senator MORGAN. Each of these movements gets up an impetus, and with such a vast mass of metal, or such a vast ship floating, that is very hard to check, is it not?

Mr. PARSONS. It is.

Senator MORGAN. There has to be very careful work done in checking it, to prevent it from going through the gates?

Mr. PARSONS. Unquestionably.

Senator MORGAN. It is a difficult operation?

Mr. PARSONS. Very.

Senator MORGAN. And a dangerous one?

Mr. PARSONS. Very.

Senator MORGAN. If that is repeated three times in succession, the danger would be, it seems to me, increased in some proportion at least.

Mr. PARSONS. I do not know that it makes any difference whether you make those three movements in close succession or whether you make them at longer intervals. The movements are exactly the same.

Senator MORGAN. In the case of a flight of three locks, an accident to either gate in that flight would involve the whole length of the system, would it not?

Mr. PARSONS. No; not necessarily. Suppose a vessel had passed the upper lock in safety, and was in the middle lock, and then something went wrong, and she carried away the gates—the gates of the upper lock would hold back the water in the upper level. You would simply then destroy the vessel and the lower two locks, and probably not enough water would go down to destroy the lower reach of the canal. That would not make a catastrophe; it would make a bad accident so far as that vessel was concerned and so far as the lower gates were concerned.

Senator MORGAN. Suppose the accident should occur as the vessel was entering the first lock of the three?

Mr. PARSONS. She would probably carry all three away.

Senator MORGAN. She would probably carry all three away?

Mr. PARSONS. Yes, sir.

Senator MORGAN. The damage, then, to the canal would be probably threefold in a case of that sort?

Mr. PARSONS. That is it, exactly.

Senator MORGAN. Yes.

Mr. PARSONS. And that is the reason why the majority of the board in formulating a plan for a lock canal was insistent that the locks themselves should be separated, so as to diminish the accident.

Senator MORGAN. Did they lay emphasis upon that proposition, that locks separate from each other would be safer—

Mr. PARSONS. Oh, yes.

Senator MORGAN (continuing). Than when connected in a flight?

Mr. PARSONS. Oh, yes; yes.

Senator MORGAN. That is what I wanted to get at.

Mr. PARSONS. The majority of the board was quite insistent on that point. The minority members of the board preferred putting them in flight because it is cheaper construction.

Senator MORGAN. Yes.

Mr. PARSONS. In other words, they were avowedly governed, as they stated, by that consideration.

Senator MORGAN. They preferred it on account of the less cost?

Mr. PARSONS. On account of the less cost.

Senator MORGAN. That was the whole affair?

Mr. PARSONS. That was the whole affair. They disagreed with us, I think, in our estimate of the danger involved. I want to say that—that the minority did not share our views in regard to the total amount of danger, or, otherwise, those gentlemen would never in the world have prepared the plans they did. They did not, and I presume do not, agree with us in regard to the probable danger. They think a vessel can be controlled, and that the accident of a vessel plunging through a flight of three locks will not occur.

Senator KNOX. What has been the experience at other locks in other canals?

Mr. PARSONS. In the Manchester Canal the accident has happened three times, as I described a few minutes ago.

Senator KNOX. Yes; I was not here.

Mr. PARSONS. When vessels have actually gone through the locks. In that case the locks were separate and the gates were closed by the men on shore. Seeing that the vessel was going through—that control had been lost of the vessel—they succeeded in partially closing the gates, and the rush of the water following the vessel brought the gates to with a great bang. The gates were wrecked, but not sufficiently wrecked as to be entirely carried away, so that the water in the upper level, in each one of the three cases, was, fortunately, restrained; otherwise, of course, there would have been a terrific disaster.

Senator MORGAN. The vessel was saved by the alacrity of the men in closing the gates?

Mr. PARSONS. The canal was saved; the vessel went through. The canal was saved by the alacrity of the men in getting the gates started, and they were half closed, and then, of course, the terrific rush of water carried the gates themselves to.

Senator MORGAN. Yes.

Mr. PARSONS. Each one of those locks, I think, was out of service for something like a month before new gates could be put in place. The locks were in duplicate, however, so that the canal was able to maintain traffic in a partially crippled condition.

Senator DRYDEN. What have you to say about the waste of space and water in the use of these locks for small boats?

Mr. PARSONS. That, of course, is very, very great. That is another objection. It is a minor one, but it is another objection to locks in flight. If you have a single lock you can then put in intermediate gates, dividing your 1,000 feet into lengths of, say, 600 and 400 feet, or whatever lengths you might prefer, so that short vessels in passing one of the locks need not draw off a full lockful of water. But where you come to have the locks in flight that arrangement is not possible, and you have to draw off a full lockful of water every time, so that the waste of water in the case of locks in flight is very much greater than it would be in the case of separate locks.

Senator DRYDEN. That goes to the point of the possible congestion that might occur in a fleet of vessels getting through, getting along the canal; but as to the waste of water, how serious a matter is that? How important is that?

Mr. PARSONS. I do not attach very much importance to it; and for that reason I have not raised it. It is merely an objection.

The lakes that have been proposed by the minority, as you can see by looking at the map there, are very great; and those lakes will store enough water through the dry season to permit the locking through of, I think, any tonnage that can now be foreseen. Should, however, the occasion demand, and the tonnage be increased, an additional dam could be put in on the upper Chagres at Alhajuela, and possibly at some of the other tributaries, so that practically the whole of the rainfall of the Chagres Valley could be stored; and in that case enough water could be obtained to lock through, I think, any imaginable amount of tonnage.

Senator DRYDEN. But in regard to the congestion. If the demand upon this canal should get to be very, very great and a fleet of vessels was waiting to get through, and one of these long locks had to be given up entirely to a small boat, that would be quite a serious matter, would it not?

Mr. PARSONS. It would be quite a serious matter.

Senator MORGAN. In the delay which would occur in these vessels getting through?

Mr. PARSONS. It would be quite a serious matter unless two or three of those small boats should come together, then they could be locked through simultaneously.

Senator DRYDEN. Would that be safe and practicable?

Mr. PARSONS. Oh, they do that right along at the Soo. But that means that vessels have got to arrive simultaneously, or substantially simultaneously, in order to get that done. If you are going to hold one vessel until the next boat arrives, of course you are going to delay the first vessel.

Senator HOPKINS. What do you estimate is the time necessary to lock a vessel through a three-lock flight?

Mr. PARSONS. That was set forth in the report of the Isthmian Canal Commission--the so-called Walker Commission.

Senator HOPKINS. I am asking you what your estimate is--in the objections you make to it.

Mr. PARSONS. I was going to give you those figures. The figures that they gave in that report I concur in.

In the report of the Board of Consulting Engineers there is no detailed calculation showing the time required to pass a vessel through

the locks. You will find in that report a paper written by Mr. Noble and Mr. Ripley on the capacity of the canal for traffic, in which there is a statement —

Senator KITTREDGE. You refer to the minority report?

Mr. PARSONS. No; I am referring to a paper which appears in the appendix to the report (it is really simply a contribution), in which they show a calculation as to the traffic that a lock canal could carry. They show there, in a flight of three locks, a computation that if everything worked exactly right vessels could pass at intervals of fifty minutes through a three-flight lock. That is, by the time, of course, the vessel passed the first lock, when she got down into the second lock, but while she was going through the intermediate lock the upper lock would be filled, and the next succeeding vessel would enter the upper lock while the first vessel was still passing through the lower lock; and they make the calculation that vessels could follow each other at intervals of about fifty minutes. That, of course, is based wholly on theoretical considerations. If you refer to that paper you will see that it worked out into seconds, and it means that everything has to work exactly right.

Now, in practice, it is found, in the case of lock canals, that you have to allow about 50 per cent in addition to the theoretical computation to cover the unavoidable delays. The instant the gates are opened the vessel is not quite ready to move; the captain waits, naturally, until the gates are opened, and until he knows they are open. Then he has to give his orders to cast off his lines, and that all takes time; and there is the inevitable delay that you can not possibly avoid in the handling of a large ship.

Senator HOPKINS. Are you familiar with the manner in which they lock vessels through at the Soo, and the time that it takes there?

Mr. PARSONS. Yes. Mr. Ripley was superintendent of the Soo Canal, so that his computation is based upon his own experience in the filling and the opening of locks, but they make no pretense that that is a practical calculation. It is merely a theoretical calculation of the minimum time required.

Senator HOPKINS. You have no personal experience, have you, on this question, either at the Soo or at any other place?

Mr. PARSONS. Except as I have —

Senator HOPKINS. Except as you have gathered statistics from others?

Mr. PARSONS. Except as I have sat with a watch and timed vessels going through locks.

Senator HOPKINS. That is what I wanted to know—whether you have done that.

Mr. PARSONS. Yes, sir.

Senator HOPKINS. Where was that—at the Soo?

Mr. PARSONS. I have timed them on the Manchester Canal, and I have timed them on the Kiel Canal—large steamers.

Senator HOPKINS. What is the length of time at those two places?

Mr. PARSONS. I can not tell you offhand, because I have not my notebook here with me. Of course, in both those cases, the locks have very much lower lifts than there would be here.

Senator HOPKINS. What is the depth of the lock at Manchester?

Mr. PARSONS. Six hundred feet.

Senator HOPKINS. How many locks are there?

Mr. PARSONS. There are four locks and a tidal lock—five altogether.

Senator KITTREDGE. In flight?

Mr. PARSONS. No; they are separate.

Senator HOPKINS. How is it at the Soo?

Mr. PARSONS. The Soo has one lock at one place, but I think there are some four locks, and the Government is now building a fifth to accommodate the traffic.

Senator HOPKINS. Are they in flight, or separate?

Mr. PARSONS. No; that is a single lock.

Senator HOPKINS. And what are the lengths of those locks?

Mr. PARSONS. They vary a great deal. Originally there were two tandem locks, each 350 feet long by 70 feet wide, having a lift of 10 feet each. Then the Weitzel lock, 550 feet long, was built, between 1870 and 1881. Then the original tandem locks were replaced, between 1887 and 1896, by the Poe lock, 800 feet long and 100 feet wide.

Senator KITTREDGE. And of what lift?

Mr. PARSONS. A lift of 20 feet. That makes two locks. Then there is the Canadian lock, which is 900 feet long and 60 feet wide; and now, I believe, the Government is projecting a new lock.

Senator KITTREDGE. In that connection, Mr. Parsons, do you remember the usable dimensions of the lock at Panama proposed by the French company in 1896 or 1897?

Mr. PARSONS. Seven hundred and forty feet, I think, if I recollect rightly.

Senator KITTREDGE. Do you remember the usable length of lock proposed by the Walker Commission, appointed in 1899 and reporting in 1901?

Mr. PARSONS. Have you a copy of that report here? I would like to refer to it.

Senator MORGAN. That is obsolete.

The CHAIRMAN. I do not think we have a copy handy to-day, Mr. Parsons.

Mr. PARSONS. It is from 740 to 800 feet—somewhere in that neighborhood.

Senator KITTREDGE. Do you refer to the report of the Walker Commission?

Mr. PARSONS. I refer to the report of the Walker Commission.

Senator KITTREDGE. It was 800 feet, was it not?

Mr. PARSONS. I think it was about 800 feet—somewhere between the French figure and 800 feet.

Senator KITTREDGE. And you were showing this morning that the locks proposed by the minority on paper proposed to give a usable dimension of 900 feet, but in fact they are less than 800?

Mr. PARSONS. In fact, they are less than 800.

Senator KITTREDGE. And the largest ship now building on the stocks is of what length.

Mr. PARSONS. Seven hundred and eighty-eight feet, I think.

Senator KITTREDGE. You can supply those exact figures later, if you will, Mr. Parsons.

Mr. PARSONS. I will get them during recess.

Senator KITTREDGE. As to the locks projected by the French, and then by the Walker Commission?

Mr. PARSONS. I will get that information during recess.

Senator MORGAN. You were on the commission when that report was made, were you not?

Mr. PARSONS. No, sir.

Senator MORGAN. You were not?

Mr. PARSONS. I was not on the so-called Walker Commission.

Senator MORGAN. No; I remember now.

Senator HOPKINS. Are there any conditions that exist there at Gatun that would interfere with their having a lock 900 or 1,000 feet long?

Mr. PARSONS. Yes. The topography is such that you could not get in the three locks.

Senator MORGAN. Why?

Mr. PARSONS. The hill is not long enough.

Senator MORGAN. It gives out?

Mr. PARSONS. The hill gives out.

Senator HOPKINS. Could they not have two locks? Could they not meet the question there by a two-lock system instead of three?

Mr. PARSONS. Certainly.

Senator HOPKINS. And then they could have a 1,000-foot lock there, could they not?

Mr. PARSONS. Certainly; but that is not the plan that the minority propose.

Senator HOPKINS. I am not speaking of whether it is their plan or not; but they could, at that point, have a two-lock system of 1,000 feet each?

Mr. PARSONS. I think the best thing to do—

Senator HOPKINS. I am not asking you what is the best thing to do. They could have that, could they not?

Mr. PARSONS. Certainly.

Senator MORGAN. What would be the lift of those two locks?

Mr. PARSONS. If you are going to come up to the 85-foot level, they would be 42½ feet apiece, Senator.

Senator MORGAN. That is a very high lift, is it not?

Mr. PARSONS. That is a very high lift—a lift that has never been built.

Senator MORGAN. A dangerously high lift?

Mr. PARSONS. I think there is no question about it.

Senator MORGAN. Now, I want to ask you just a few questions. That dam at Gatun is 85 feet high?

Mr. PARSONS. Eighty-five feet high.

Senator MORGAN. It is meant to carry a head of water 85 feet deep?

Mr. PARSONS. Yes. When you speak of the height of the dam, the dam itself is to be some 50 feet higher than that, as projected; but it is to carry 85 feet of water.

Senator MORGAN. Yes; 85 feet of water. That 85 feet of water is expected to reach across to Miraflores or to Pedro Miguel somewhere?

Mr. PARSONS. Yes.

Senator MORGAN. Clear across the cut?

Mr. PARSONS. Clear across until you get to the Pacific slope.

Senator MORGAN. It is also expected to make dead water on the right bank of the Chagres River and a very considerable distance up the Gatun River and the next river to it, the Gatuncilla? Are there two rivers there, one called the Little and the other the Big Gatun?

Mr. PARSONS. There are really two Gatuncilla Rivers, and we have

been inclined to call the lower Gatuncilla, the one at Gatun, the Gatun River. There is another Gatuncilla that is tributary to the upper Chagres. They are both called the Little Gatun.

Senator MORGAN. Keeping up the right bank of the Chagres River, taking in all the affluents until you get up to Gamboa, this lake seems to go up above Alhajuela?

Mr. PARSONS. Almost up to Alhajuela.

Senator MORGAN. Almost up to Alhajuela?

Mr. PARSONS. Yes, sir.

Senator MORGAN. Alhajuela, then, on this map, would be outside of the map itself?

Mr. PARSONS. No, sir; here is Alhajuela [indicating].

Senator MORGAN. Oh, yes. Then it goes away above it?

Mr. PARSONS. The lake itself comes up to a point a few miles south of Alhajuela. It does not quite get to Alhajuela.

Senator MORGAN. From Alhajuela on up to the top of this map that is before us have topographical surveys been made of sufficient accuracy to determine what would be the body of water in that upper region of the Chagres?

Mr. PARSONS. Substantially; yes.

Senator MORGAN. Then, coming on to the left bank of the Chagres River, there is a body of dead water that runs down there. That represents what river, the Indio?

Mr. PARSONS. The valley of the Trinidad.

Senator MORGAN. The Trinidad?

Mr. PARSONS. Yes; that is the Trinidad. The Indio flows directly into the sea. That is another valley.

Senator MORGAN. Now, next upon the left bank comes in another river. What is that, the Indio?

Mr. PARSONS. These rivers in here [indicating]?

Senator MORGAN. Yes.

Mr. PARSONS. This is the Gigante.

Senator MORGAN. Yes, the Gigante; and those are the principal streams that enter on the left bank of the Chagres River until you get up to Bohio?

Mr. PARSONS. Yes.

Senator MORGAN. And then the Obispo comes in on the left bank?

Mr. PARSONS. And then the Obispo comes in on the left bank.

Senator MORGAN. What is that other main stream just above the Obispo that comes in on the left bank farther up the Chagres—that long one, above where your pencil is?

Mr. PARSONS. That one [indicating]?

Senator MORGAN. No; still farther up the map—that middle one.

Mr. PARSONS. Do you mean that one [indicating]?

Senator MORGAN. Yes.

Mr. PARSONS. That is not a river at all. That is the old highway from Las Cruces to Panama.

Senator MORGAN. Oh, yes; I was mislead by that. Now, all of that weight of water practically bears upon the Gatun dam? I do not mean as weight, but I mean as pressure.

Mr. PARSONS. Yes.

Senator MORGAN. It has to be strong enough to hold all of that water at an 85-foot level (not above its base, but at the surface level of 85 feet) over all this great area that is mentioned here?

Mr. PARSONS. As a matter of fact, Senator, the pressure on that dam would be just the same if that lake extended back but a few feet. The extent of the lake does not increase the pressure on the dam.

Senator MORGAN. That is the point I was trying to get at. Can you account for that?

Mr. PARSONS. The pressure is due to the height of water, and not to its width. This water back here is not exerting a pressure against that dam. That is being carried on the ground beneath it. It is the water next against the dam which makes the lateral pressure. The lateral pressure is due, in other words, to the height, and to the height only.

Senator MORGAN. As an engineering rule, or as a rule of hydraulics, how far from the Gatun dam would that pressure extend? Take it in feet or yards.

Mr. PARSONS. Theoretically, no distance at all.

Senator MORGAN. None whatever?

Mr. PARSONS. None whatever. It is simply a question of the height of the water against your dam, so that the extent of the lake behind it, back, has no effect upon the dam itself.

Senator MORGAN. And if the height of water—that means the depth of it—was half of 85 feet, the pressure would be just half?

Mr. PARSONS. Just half.

Senator MORGAN. And so on down—graded on down in that way?

Mr. PARSONS. Yes, sir.

Senator MORGAN. It depends entirely upon the perpendicular?

Mr. PARSONS. It depends entirely upon the perpendicular height and not upon the lateral distance of the surface of the water.

Senator MORGAN. Then every foot that you raise the water above the normal level adds that much pressure to the dam?

Mr. PARSONS. It adds that much pressure to the dam.

Senator MORGAN. And that is the pressure that the dam has to withstand?

Mr. PARSONS. That is the pressure that the dam has to withstand.

Senator HOPKINS. What is that pressure per foot?

Mr. PARSONS. One hundred feet of water weigh about 43½ pounds. So you see that it is a little less than half a pound per foot.

Senator MORGAN. I have no further questions to ask with respect to that matter. It looks to me like a very poor substitute for Lake Nicaragua, however, which was 102 miles long, 45 miles across, and 40 feet deep, with a lake above it 25 miles long and 22 miles wide and about 50 feet deep. I think nature or the Almighty has done more for us there than the engineers will ever be able to do at Panama.

Senator HOPKINS. Mr. Parsons, you spoke about some accident occurring in the Manchester locks and at one other place. The conditions were abnormal, were they not, at the time of the accident that you spoke of?

Mr. PARSONS. No, sir; no, sir. They were just the ordinary conditions of traffic.

Senator HOPKINS. How did the accident occur, then, if the conditions were normal?

Mr. PARSONS. One case that I described, to show how an accident may occur, was when the wire parted between the—

Senator KNOX. He has been all over that.

Senator HOPKINS. Oh, I withdraw the question, then. You have been all over this proposition, have you?

Mr. PARSONS. Yes, sir.

Senator HOPKINS. Then I will not repeat it. Of course I came in later; but I will read your evidence.

Senator DRYDEN. Mr. Parsons, the statement has been made, I think, that a lock canal can be completed in a little over half the time that a sea-level canal can, and at something over \$100,000,000 less in cost. Have you any figures upon that matter?

Mr. PARSONS. I think that the time for the construction of the sea-level canal has been rather overstated in that estimate. The advocates of the sea-level canal felt that the canal could be constructed in from ten to eleven years.

In the hope that we could get a unanimous vote upon that period of time we agreed to make it from twelve to thirteen years; and that resolution stood, which I considered, in my judgment, was a year or more too much. It would undoubtedly take a longer time to construct than the lock canal, but I do not think anything like the extent of two to one. In the construction of these huge locks, with all their complicated machinery, which would have to be built up step by step, I think the chances for delay are quite as great as the chances for delay in the making of the larger excavation.

(At this point it was suggested that the committee take a recess until 2 o'clock p. m.)

Senator DRYDEN. I would like, before that is done, to have Mr. Parsons tell us something in regard to the question of cost.

Mr. PARSONS. The same thing is true in regard to the question of cost. Both estimates were made on substantially the same basis, that is to say, the same basis of unit prices. After they were completed the same allowance was made of 20 per cent to cover the question of general expenses and contingencies.

If you will look at the figures you will see that that extra allowance is very much greater in connection with the sea-level canal than it is with the lock canal; and I believe that in that extra allowance there is a very much bigger margin for contingencies than there is in the smaller amount. In other words, when you get to dealing with constructions of such a vast extent as this, running over \$100,000,000 or \$200,000,000, the contingencies are not in proportion to the total expense—that is, if you are putting up a structure that is going to cost you \$100,000 you might very easily find that some one item was going to run up the expense, but when you come to deal in figures of fifty or a hundred millions you will find that while one item will overrun you will also probably find that other items will underrun, and therefore it is a little unfair to add the same proportion for contingencies in the bigger canal that you add in the smaller canal.

Senator DRYDEN. Have you any information as to the probable damage that the Government might have to pay for lands to be submerged?

Mr. PARSONS. The board tried to make some estimates on that, and finally gave it up as something that could not be estimated. I notice that the minority, however, did attempt to make such an estimate; and they put in their report an estimate of a comparatively small sum of money.

My own experience is that in the question of land damages, where lands have to be taken by condemnation, the cost is always far in excess of the original estimates, and we have already had some experience of our own in that regard in the taking of lands in Panama. If the committee call General Davis, who was governor of the Isthmus for over a year, I think you can get from him some very valuable information on that point, in the way of showing just exactly what lands have cost the United States Government by condemnation as against what those lands were actually sold for by private sale.

I think, therefore, that you will find that in submerging the lands to the extent that the minority plan calls for, there would be a very, very large addition to the estimated expense.

Senator KNOX. What is the character of that land?

Mr. PARSONS. The land itself is, to a great extent, uncultivated.

Senator KNOX. Is it inhabited?

Mr. PARSONS. It is along the line of the railroad; and all the little villages along the lines of the railroad would be submerged.

Senator HOPKINS. Let me ask you right there, Mr. Parsons, if the land does not belong to the railroad company, and if those buildings are not occupied by tenants rather than owners in fee?

Mr. PARSONS. In some cases that is true. In other cases it is not, and you will find that you would have to dispossess a great many of the inhabitants.

Senator KITTREDGE. In either case the land would be lost, would it not?

Mr. PARSONS. In either case the land would be lost; but in the one case you would have to pay for it—you would have to buy it from the present owners; and the experience of the United States Government so far has been very unpleasant in regard to all forced purchases of land.

Senator HOPKINS. Have you any figures, or did your committee make any figures, as to the proportion of land along the railroad there that is occupied by parties where they would have to settle with people who would claim to be owners in fee rather than tenants?

Mr. PARSONS. I think a statement of that sort is incorporated in the report; but the land that is privately owned that would be expensive to acquire is that which lies along the railroad and which would be overflowed by these big lakes, taking the village of Gatun, for instance.

Senator KITTREDGE. In addition to that, Mr. Parsons, the testimony of Judge Magoon is in point.

Mr. PARSONS. And the testimony of Judge Magoon is in point. I think General Davis can give you some figures of lands that we have been obliged to purchase in the neighborhood of Panama; and I think you can see at once there that if that ratio of probable values to actual cost is to be maintained over the rest of the line, there would be a very, very large bill to pay.

The CHAIRMAN. Mr. Parsons, the land purchased there at Panama would be considerably more valuable than that here, would it not?

Mr. PARSONS. It is to be hoped so; or, rather, it is to be hoped that the land you would have to purchase along the Zone would be less expensive land than what you bought in Panama; otherwise you could save a good many hundred million dollars by building a sea-level canal, Senator?

Senator TALIAFERRO. Mr. Parsons, did you read the testimony of Mr. Burr on the question of the value of these lands?

Mr. PARSONS. I do not think I did. I have not seen Professor Burr's third day's testimony. I have had the first two, but I have missed his third day. I came on from New York yesterday, and I think it arrived there yesterday. I think it crossed me.

Senator TALIAFERRO. He thought that the demand for these lands, in case the Government determined to acquire them, would be very extravagant?

Mr. PARSONS. That is what I am saying now. I do not think there is any doubt about that. I think that the estimate that the minority have made is wholly out of proportion—wholly out of proportion.

Senator TALIAFERRO. I think he estimated that the cost of those lands would run up to about eighteen millions on the basis of what the people there have required the Commission to pay.

Mr. PARSONS. We started to make some figures in the board, but we finally gave it up. We found that if we were to take any such ratio as had lately been the rule, it carried us away up into the millions, and we gave it up.

Senator KITTREDGE. How far into the millions, Mr. Parsons?

Mr. PARSONS. We got up into five figures, ten millions and odd, and we stopped. It led us to a figure that was almost ridiculous, and a figure that it would certainly be inadvisable to put in an official report, because it would probably be taken as evidence of what we considered the value of the land—not what we feared the land might cost, but what we considered the value of the land; and, therefore, we decided, as a matter of policy, not to put it in.

The CHAIRMAN. Did you make your estimates on the same basis that you had paid for land about Panama?

Mr. PARSONS. No, sir; because that would have very greatly exceeded the \$10,000,000. We made an estimate as to what land had cost up in that country, and then applied the same ratio of Panama to it. We tried to work it in that way, and then we also took lands where the natives had asked prices, where they had set values upon it as to what they were willing to sell for; but we gave it up as something that it was utterly impossible to estimate.

The CHAIRMAN. There is one question I would like to ask you, Mr. Parsons, just here. Do you recall, without looking, the length of the locks in the Kiel Canal?

Mr. PARSONS. I know just where that information is; I can give it to you in one second, Senator.

The available length is 492 feet, and the width is 82 feet. At the Kiel Canal they have two tidal locks, one at each end, simply to take up the tidal variations in the Baltic and North seas.

Senator TALIAFERRO. Mr. Parsons, was there any division in the Board of Consulting Engineers on the question of the possibility of constructing this sea-level canal on the lines laid down by the board?

Mr. PARSONS. No, sir.

Senator TALIAFERRO. The objections were what?

Mr. PARSONS. The objections were that it would cost too much, both in time and money.

Senator TALIAFERRO. And that it would involve delay to vessels in crossing the Isthmus; but do not the minority contend that the lock canal affords a quicker transit?

Mr. PARSONS. Yes; but I should like to take decided exception to that statement.

Senator TALIAFERRO. Will you explain your views on that point to the committee, if you have not gone over it already?

Mr. PARSONS. I have not gone over it.

The minority gave its views on that subject on pages 85 and 86 of their report; and they have taken for the boats the largest-size passenger steamers passing between western Europe and the Orient through the Suez Canal. Those boats are of two types, one 540 feet long by 60 feet beam by 32 feet draft, and the other 700 feet long by 75 feet beam by 37 feet draft. With ten ships per day of the first type they estimated that it would take eight and nine-tenths hours for that vessel to pass through the sea-level canal, and nine and five-tenths hours to pass through the lock canal. With the larger type vessel, ten vessels a day, it would take eleven and six-tenths hours to pass through the lock canal and ten and five-tenths hours to pass through the sea-level canal; and with thirty ships per day it would take longer, according to their computations, to go through the lock canal than to go through the sea-level canal.

They have assumed for comparison not the ordinary type of ship of commerce, in the first place, but the extreme vessel of the large passenger type, which, in the first place, I do not think is a fair comparison to make. The second thing is that they have assumed all sorts of delays in passing through the sea-level canal; that those vessels have to stop and tie up, and in the lock canal that the locks are all going to work without any delays; that they are all going to be in service, and that the vessels are going to be put through the locks on schedule time.

Senator TALIAFERRO. In other words, they charge delays to the sea level canal, and take ideal conditions for the lock canal?

Mr. PARSONS. And take ideal conditions for the lock canal. I do not think that that is a fair presentation of the case at all.

The ordinary type of vessel, the ordinary vessel of commerce, the ocean tramp steamer (which will form, of course, the great bulk of the travel through the Panama Canal), is a boat that is about 450 feet long, from 45 to 50 feet beam, and that draws from 27 to 28 feet of water. Those boats will be able to pass anywhere in a canal 150 feet in width.

Senator KITTREDGE. At what speed, Mr. Parsons?

Mr. PARSONS. Probably one of them would stop and allow the other to go by at speed, but the present Suez Canal (and in considering this whole question, gentlemen, I do not think I can do any better than to urge you to keep in mind the Suez Canal) has now a width on the bottom of 118 feet and a width in the passing places of 147 feet. That canal is now being widened by connecting the passing places, so that it is to have a bottom width of 147 feet.

In other words, the Suez Canal, when widened, will be narrower than the proposed Panama canal; and they expect that all ordinary vessels will be able to pass through that canal. In other words, they expect that width to make that canal a "double-track" canal.

The CHAIRMAN. Without stopping either one of the ships?

Mr. PARSONS. The ordinary small vessels may expect to go right by without stopping. Other vessels, of course, would have to stop. They would stop one and let the other go by. In other words, vessels going one way would have the right of way.

The CHAIRMAN. When a boat stopped, would it necessarily have to be tied up?

Mr. PARSONS. I think that, again, depends largely upon the size of the vessel. If you are going to pass through two Cunarders, or if you are going to pass through a couple of battle ships, then of course you have to take special precautions, and undoubtedly you would make one of them tie up. Probably a big battle ship going through would insist that all other vessels should be tied up. They steer badly, and especially steer badly, in restricted waters.

The CHAIRMAN. The difference in time, then, in either of the plans is not great?

Mr. PARSONS. The difference in time is not great; but taking the loss of time at the locks in passing through one flight of three locks, one flight of two locks, and a single lock, allowing 50 per cent in addition to the theoretical time, it works out a loss of time of something over four hours (about four hours and ten minutes) in passing through the lock canal.

Senator KITTREDGE. Explain what you mean by that. I do not quite understand where the loss comes in.

Mr. PARSONS. The loss comes in, in the first place, in that a vessel approaching a lock has to slow down; then she has to stop; then she has to start again and enter the first lock; then the gates have to be closed; then she has to be made fast; then the water has to be withdrawn from the locks; then the lines have to be cast off; then the gates have to be opened; then she has to start ahead slowly, and if there are locks in flight she has to move ahead at a very slow speed and stop in the next lock, and then all this operation has got to be repeated.

Each one of those steps takes considerable time, so that (basing the computations upon the computation as given in great detail in the report of the Walker Commission, which you will find fully set forth on page 267 of that report) it would take an hour and thirty-three minutes to pass three locks in flight. In other words, it would take a vessel an hour and thirty-three minutes to go through the Gatun locks, theoretically, and that is substantially corroborated by the Noble-Ripley computation, as given in the appendix to the consulting engineers' report, that vessels could follow in that lock at an interval of fifty minutes, because at the end of the fifty minutes the first vessel would still be in process of locking in the lower lock. So that those two computations are substantially the same.

That is the theoretical time. If, therefore, you add to that 50 per cent to allow for the inevitable delays, that everything will not work exactly on time, it will make a period of two hours and nineteen minutes for a steamer to pass those three locks.

Senator KITTREDGE. And then there would be the same delay on the other side?

Mr. PARSONS. On the other side it would be rather worse. In the first place, the vessel has to pass the double flight of locks, which again (allowing 50 per cent in addition to the theoretical time) would take her an hour and thirty-one minutes. Then she has to pass the single lock, which would take fifty minutes; so that to pass the single lock and the double lock would take two hours and twenty-nine minutes. In other words, it would take her ten minutes longer to pass the separate locks than it would to pass the locks in flight. That is due

to the fact that a vessel in approaching a lock has to slack her speed some distance down before she stops; whereas when the locks are quite close together that loss is saved in passing from one lock to the other. So that altogether the total time taken in passing the single lock, the double lock, and the triple lock would be four hours and forty-eight minutes.

It would take the vessel at her normal rate of speed, say, thirty-eight minutes to pass that same distance if she had been allowed to steam ahead at her ordinary rate of speed. That, of course, is to be deducted. So that the actual time lost can be taken at about four hours and ten minutes as the time actually lost in passing the locks.

Now, then, if a vessel is making 6 miles an hour, you see, she would have gone 25 miles in that time. She would be halfway across the Isthmus in the time that a vessel would take in going through the locks.

Senator KNOX. That does not mean, however, that when vessels are going through a flight of locks there is a loss of service to other vessels for that entire length of time?

Mr. PARSONS. No; as I have pointed out, two vessels could be in a flight of three locks at the same time.

Senator KNOX. Yes.

Mr. PARSONS. But that is the time taken by any single vessel. She loses over four hours in going through the locks of a lock canal.

Senator TALIAFERRO. Is it considered altogether safe, Mr. Parsons, to put two of those large vessels in that flight of locks at the same time?

Mr. PARSONS. No; I do not consider that the three locks are safe at all, gentlemen. I want to be distinct about that. I have kept repeating that. I consider that the three locks in flight are radically and fundamentally wrong. I want to be just as positive on that point as I possibly can be, and I want to say that if the Government undertakes to build locks in flight I want it to be understood here now—I want to go on the record to that effect—that it is against my emphatic protest as a matter of safety.

Senator TALIAFERRO. Are any locks in flight now in use on any of the canals that you know of?

Mr. PARSONS. No; I think on all the big canals they are all separated. Of course on the small canals, where canal boats go through, they are frequently combined, but there there is no great danger. If an accident occurs it does not make any difference.

Senator TALIAFERRO. Was there any exception on the part of the minority to the estimate of cost of this sea-level canal as fixed by the board?

Mr. PARSONS. No; they have made no protest on that in their report, and in our discussions they accepted that as a fair estimate of cost, just as we accept in general the estimate of cost that they have made for their lock-canal scheme.

Senator TALIAFERRO. And, as I understand, the majority rather extended the time that they supposed would be required to construct this sea-level canal, in order to get a unanimity of expression on the subject from the Board?

Mr. PARSONS. We tried to get unanimity of expression on the subject.

Senator KNOX. The situation would be rather hopeless for us, Mr. Parsons, would it not, if upon a given work there should be very much variation in your estimates as to cost?

Mr. PARSONS. Oh, yes. I do not think that there is any difference. As we have stated in our report, independent of the work, a committee was appointed and prepared a statement of the unit prices, as to what were fair prices for the doing of the work. Those prices were submitted to the board and were discussed by the board, and the board made certain amendments, and I think as it appears in the record that report stands practically without amendment. The amendments were made unofficially, the committee accepted the amendments that were made, and incorporated those amendments in the report.

Senator KNOX. Then you substantially agree as to cost and as to time?

Mr. PARSONS. No; the minority differ with us as to the time of building the sea-level canal. They say in their report that they think the majority erred in that respect, and I think they put down a period of fifteen years.

Senator KNOX. Yes.

Mr. PARSONS. They dissented; we failed to get in agreement on that point. We voted unanimously in regard to the length of time it would take to build this lock plan or any lock plan. I do not think the time differs very much in regard to that. So that we agreed unanimously on that, and there is no difference in regard to the total cost of the canal. It may be that individuals will differ in regard to the details. Some of us think that certain details are possibly a little too high or a little too low; but in general, we accept each others' figures in regard to the money cost.

Senator HOPKINS. But you say, Mr. Parsons, that the minority did not accept your figures as to the length of time it will take to construct a sea-level canal?

Mr. PARSONS. No; they say it will take fifteen years.

Senator HOPKINS. And, as I understand, the majority, who united on thirteen years, only took that figure as a compromise among themselves?

Mr. PARSONS. We tried to compromise with the others.

Senator HOPKINS. Yes. Now, you think that eleven years would be a sufficient time?

Senator TALIAFERRO. One moment, Senator, before he answers this question. I want to call his attention to Mr. Burr's testimony on the subject and see if they are in agreement.

Senator HOPKINS. I will develop that.

Senator TALIAFERRO. Go ahead, then.

(By request the stenographer read aloud the pending question asked by Senator Hopkins.)

Mr. PARSONS. I think eleven years is a sufficient time.

Senator HOPKINS. What was the greatest length of time that any member of the majority thought it would take, but finally compromised with you on thirteen years?

Mr. PARSONS. From eleven to twelve.

Senator HOPKINS. How did they compromise on thirteen, then?

Mr. PARSONS. We tried to compromise with the minority.

Senator HOPKINS. Oh, with the minority. I see.

Mr. PARSONS. We tried to compromise with the other side.

Senator HOPKINS. Yes; that was what I was getting at. Then the compromise on thirteen years in your report is not a compromise by the members of the majority?

Mr. PARSONS. No, no. We all added to that in order to try to compromise with the others.

Senator HOPKINS. You fixed on thirteen years and tried to get the minority to do so?

Mr. PARSONS. We tried to get the minority to come down to that figure.

Senator HOPKINS. To agree with you that it would take no longer than thirteen years?

Mr. PARSONS. Yes, and they refused to compromise; but, having offered to compromise, we let it go.

Senator HOPKINS. Yes. What number of years, if you remember, did Professor Burr estimate it would take?

Mr. PARSONS. Ten years; I think he puts it at about ten years.

Senator TALIAFERRO. Mr. Parsons, were not these estimates as to the time required to build the sea-level canal based on the idea that there would be one shift a day of eight hours?

Mr. PARSONS. Yes.

Senator TALIAFERRO. In the first place, can not the work be more rapidly done?

Mr. PARSONS. I think it can be.

Senator TALIAFERRO. And just as cheaply, working two shifts a day, for instance, instead of one?

Mr. PARSONS. I think that any competent contractor who had charge of that work would work at least two shifts a day.

Senator TALIAFERRO. If that were done, would it not reduce the time that you have estimated for the completion of that canal below ten years?

Mr. PARSONS. I think it possibly would; I should be hopeful of it; but I want to state figures that I feel quite sure of. In other words, I want to state such figures that if a party came to me and asked me for my advice as to taking a contract for the doing of that work, I could say to him: "Now, I know it should not cost you more than that, either in time or in money." Then I should go to work and figure on using, the greater part of the year at any rate, two shifts, and endeavor to get the work done in very much less than eleven years of time.

Senator TALIAFERRO. In arriving at this unit of cost, did you consider the additional depth of excavation that would be required in the sea-level plan?

Mr. PARSONS. Yes; and we took that into account all the way through those estimates.

Senator HOPKINS. Did you estimate an increased cost per cubic yard in your excavations as you descended, or was it at the same ratio all the way down?

Mr. PARSONS. The greater part of the excavation, of course, comes in the Culebra cut, and there we assumed a cost of excavation above elevation plus ten, and below elevation plus ten.

Senator KITTREDGE. Explain what you mean by that.

Mr. PARSONS. In other words, above or below a plane 10 feet above mean sea level.

Senator HOPKINS. Yes.

Mr. PARSONS. Above that, the tracks would be running downward, and the material would come down to the sea-level, the level of the

ground below, by gravity. The ground cut could be made to self-drain, and the work would proceed in the simplest possible manner.

Below that plane the excavations would have to be pumped, and the material would have to be hauled up from an excavation to the surface of the adjacent ground, and the work would be carried on within restricted limits, of course adding to the cost.

Senator TALIAFERRO. You considered all that?

Mr. PARSONS. That was all taken into account, and we divided on the plane of 10 feet above mean sea level.

Senator HOPKINS. Have you the figures so that you can tell us to-day what you figured on excavations per cubic yard 10 feet below sea level?

Mr. PARSONS. That is right here. I think I can give you the whole thing.

Senator KITTREDGE. It is in the report, is it not?

Mr. PARSONS. That is all in the report.

Senator HOPKINS. And 20 feet below, and 30 feet, 40 feet, and so on?

Mr. PARSONS. We divided at elevation plus 10; we averaged it all above plus 10 and averaged—

Senator HOPKINS. Leave out that "elevation plus 10." What I want to get at is whether you estimated the expense of the excavation of a cubic yard 20 feet below sea level at the same price that you did the excavation of a cubic yard 10 feet below sea level?

Mr. PARSONS. We averaged everything.

Senator HOPKINS. Did you do that?

Mr. PARSONS. No, sir; we made no attempt to separate it, minus 20 or minus 30 or minus 40, but we took everything below the plane of plus 10 and averaged the cost.

Senator HOPKINS. At what figure did you fix the cost of the excavation of a square yard 10 feet below sea level at the Culebra cut?

Mr. PARSONS. It was \$1.25, I believe.

Senator HOPKINS. One dollar and twenty-five cents a cubic yard?

Mr. PARSONS. Yes, sir.

Senator HOPKINS. Then 20 feet below, how much would it be a cubic yard?

Mr. PARSONS. We estimated it at \$1.25.

Senator HOPKINS. And 40 feet below?

Mr. PARSONS. We estimated it at \$1.25.

Senator HOPKINS. That is what I wanted to get at. That answers my question.

Senator TALIAFERRO. Now, Mr. Parsons, I am going to ask you to explain fully to the committee what you tried to do in answer to Senator Hopkins' question—how you arrived at that; if it was not by an average of the cost from the deepest elevation up to the sea level?

Mr. PARSONS. It was, sir. In other words, for everything below plus ten, the elevation at which we figured we would have to begin to pump, we averaged it down to the bottom of the sea-level canal.

Senator TALIAFERRO. Yes.

Mr. PARSONS. In the same way, for everything above elevation plus ten to the top of the cut, we averaged it. As a matter of fact, any one particular cubic yard at any particular depth would probably not vary very much after you have to establish a pumping plant and after you have to do certain things. The change in cost between removing a cubic yard at the depth of 15 feet and removing one at 25 feet is not very much.

Senator TALIAFERRO. Did the minority apply the same price?

Mr. PARSONS. The minority applied the same price, except that in the Culebra Cut, you see, they did not have any excavation below the elevation plus ten.

Senator TALIAFERRO. They agreed with you?

Mr. PARSONS. Oh, yes; they accepted these figures. These figures that we used, which are set forth in detail in the report, were submitted to the Board as a whole and were discussed by the Board as a whole, and they were finally accepted. Certain amendments were made, but they were finally accepted by the Board as representing our best general judgment.

Senator TALIAFERRO. Under the minority plan for the lock canal, is there any excavation along the line below plus 10?

Mr. PARSONS. Not in the Culebra cut; north and south of the Culebra cut there is. Then we applied different rates there, varying all the way from 15 cents to \$2.50.

Senator TALIAFERRO. You think, Mr. Parsons, of course, that the estimates of cost made by the Board of Consulting Engineers are safe?

Mr. PARSONS. I do not think there is any doubt of it, sir.

Senator TALIAFERRO. They are outside figures?

Mr. PARSONS. I think they are outside figures.

Senator TALIAFERRO. With the work properly done?

Mr. PARSONS. I think they are, with the work properly done. In other words, they are such figures that if anybody came to me to ask whether it would be safe to take that work at those figures, I should say, unhesitatingly, "Yes;" and as that is my business, I want to have those figures safe in giving advice.

Senator KNOX. You mean that you would advise them to take it as a commercial proposition, there being a profit in it to them for doing it at that price?

Mr. PARSONS. Yes, sir; yes, sir.

Senator KNOX. A reasonable profit?

Mr. PARSONS. Yes, sir. In other words, if the Isthmian Canal Commission should advertise for a lump sum bid, for instance (I will take the worst possible case), to construct the canal from ocean to ocean, with the breakwaters and the dams and the locks, etc., I should unhesitatingly advise a contractor to take the contract at the price mentioned in this report.

Senator KITTREDGE. Do you advise the performance of this work by contract?

Mr. PARSONS. Unquestionably, sir.

Senator KITTREDGE. Why?

Mr. PARSONS. For reasons of economy, both in time and money. I think you will get very much cheaper results and I think you will get very much quicker results.

Senator HOPKINS. Then, if it is an economy in money, you would expect that the contract would be taken at less than the figures given?

Mr. PARSONS. I do not think the United States Government, doing it by day labor, can build either canal for the estimate named. I would withdraw those figures if it is to be attempted to be done by the United States Government.

Senator HOPKINS. Then your figures are based on the idea that it is to be done by contract?

Mr. PARSONS. My figures are based on the idea that it is to be done by contract.

Senator TALIAFERRO. But they include a proper and reasonable profit?

Mr. PARSONS. They include a proper and reasonable profit to the contractor. In other words, I consider that those are figures that should be realized if you should ask for bids.

The CHAIRMAN. Would you expect a contractor to use the kind of labor that is being used there now if he should undertake this work?

Mr. PARSONS. I should not want to.

Senator HOPKINS. I take it, Mr. Parsons, that your statement about private contracts and the profit there would be in them would mean that you would give the contractor a free hand in employing his own labor?

Mr. PARSONS. He must have that; he must have that.

Senator HOPKINS. Both as to the character of labor employed and the time that the labor works per day?

Mr. PARSONS. Within, of course, reasonable policing regulations; that they should be properly housed and cared for. That, of course, the Government would naturally insist upon, and very properly insist upon.

Senator HOPKINS. You would not want to limit him to eight hours a day?

Mr. PARSONS. No; I should want to have the right to work at least ten hours a day, and I do not think it is any hardship on a man to work ten hours a day.

The CHAIRMAN. You would want to get your labor where you could get it the best?

Mr. PARSONS. Where I could get it the best; not necessarily the cheapest, but the best.

Senator TALIAFERRO. In arriving at your estimates of cost, you considered that this work was to be done by the labor they have there now, I presume, or you took that into account?

Mr. PARSONS. We took that into account; yes. We assumed that they would have to work largely the laborers there and on the basis of eight hours.

Senator TALIAFERRO. So that better labor and longer hours would correspondingly reduce the time required to build the canal?

Mr. PARSONS. I do not think there is any doubt about that, Senator. In building the subway in New York we had a lump-sum contract, you know, and a fixed time; and the work was completed according to the contract, both as to time and money. Now, if that work had been in my hands to carry out as a city undertaking, with all the restrictions that necessarily go with any public work, I know that I could not have completed the work for either the total cost or within the total time.

Senator KNOX. Do you think it is likely that you could get competitive bids for this work in its entirety on either of these plans?

Mr. PARSONS. I think so.

Senator KNOX. From one contractor?

Mr. PARSONS. I think so.

Senator KNOX. For a lump sum?

Mr. PARSONS. I think so.

Senator HOPKINS. Do you think that would be a better plan than to divide it up into sections and contract for it in that way?

Mr. PARSONS. If I were drawing the specifications for the Canal Commission, I should draw specifications inviting bids both ways, Senator—by sections or as a whole—so that you could get figures both ways. Then you could add up your individual bids and see what they amounted to; and if they were less than your single bid, let it that way, or take whichever way was the most favorable to the Government.

But I believe that you will get bids for the building of that canal in its entirety, and I believe that a single bid would be more economical than a number of bids, because the work could then be run as a whole. If you are going to let part of it to one man, his neighbor will fear that his material, for instance, is going to be carried over his section, and he would have no control over him; and he would therefore do one of two things: Either he would prohibit it, or else he would put in his bid a price that would cover the unknown delays. On the other hand, if one man takes it he goes to work and divides it up and takes care of all those things, which you can not do in the individual bidding.

Therefore I believe it will be more economical to the Government to have one general contract.

Senator HOPKINS. That would be true of either type of canal that is agreed upon?

Mr. PARSONS. That would apply to either type of canal. Then, another thing with a man who has the contract as a whole—his labor problem is very much simplified. One piece of machinery in engaging labor will answer for the whole of the work; and if one part of the work is running ahead and another part of the work is running behind, the labor or the machine plant can be transferred from that which is ahead to that which is behind, and so the work can be brought up.

Senator TALIAFERRO. And it avoids competition for the labor, too?

Mr. PARSONS. It avoids competition for the labor, and it simplifies the whole thing; and I believe that you would get bids for the whole contract.

Senator TALIAFERRO. Have you taken up the question of the dams, Mr. Parsons?

Mr. PARSONS. Not in any detail; no, sir.

Senator TALIAFERRO. Do you consider the dam as proposed by the minority at Gatun, is it not—

Mr. PARSONS. At Gatun; yes.

Senator TALIAFERRO (continuing). Do you consider that a safe dam?

Mr. PARSONS (after a pause). Yes; I consider it as a safe dam. I do not particularly like a dam at that point, but I think that dam will stay there. My objections to the dam are the features that necessarily go with it in the shape of locks, etc. I think the dam will stay. I do not particularly like the dam, but I think the dam would stay. I would rather have a dam in which I knew the water of percolation to be cut off. You are going to get water percolating beneath that dam, and some questions are going to arise. Some of our friends think those questions are very very serious. I do not know that I quite go to the length that some of them do; but when you have a question mark opposite the key detail of your whole structure one naturally hesitates.

Senator TALIAFERRO. You think it would be safer to go down to rock for that dam?

Mr. PARSONS. Oh, you could not go down to rock; it is impossible.

Senator KITTREDGE. If you could, you would?

Mr. PARSONS. If I could, I would—oh, yes; there is no doubt about that.

Senator TALIAFERRO. You did not answer the question. I asked you whether you would consider it safer to go down to rock for that dam.

Mr. PARSONS. As a hypothetical question, yes; but I should like simply to add to that answer that it is impossible to get down to rock. Rock is too far down. If that rock were down 50 or 100 feet, even, I would not hesitate; I should say, "Go right down to rock." In other words, if rock was within a reachable distance, I should go to rock.

Senator TALIAFERRO. You would not fear, with the dam as proposed, any serious underwash?

Mr. PARSONS. If that was the only way—let me put it in this way, Senator, if I may answer your question; then, if my answer is not satisfactory, give me a second try.

Senator TALIAFERRO. Answer it in your own way, Mr. Parsons.

Mr. PARSONS. If the only way to construct the canal at Panama was to build the Gatun dam as planned, I should accept the dam. If there is any other way to build it, I would rather not build the Gatun dam.

Senator TALIAFERRO. And you have pointed out two other ways?

Mr. PARSONS. The more satisfactory way, from my point of view, is not to have any dam at all.

The CHAIRMAN. If you were going to build a lock canal, where would you put the dam?

Mr. PARSONS. That depends again, Senator, upon what kind of a lock canal you are going to build. If you are going to build a lock canal—

The CHAIRMAN. Well, suppose you were going to build a lock canal?

Mr. PARSONS. There are two types of lock canal that you can build. If you are going to build a lock canal as a lock canal I should prefer the type of canal for which I voted in the Board—namely, with a small dam at Gatun, lifting the water, say, 30 feet, and then a second dam in the neighborhood of Bohio, lifting the water 30 feet more.

Those are both dams of moderate height, in regard to which there would be no question at all, because you would not get enough head of water behind either of those dams to make any percolation of any serious amount whatever. You would have, then, perfectly moderate dams that you could build without any question in regard to core walls or going down to rock or curtains or anything else. Then I should put a single lock in the neighborhood of Gatun and a single lock in the neighborhood of Bohio.

There is, however, another type of lock canal—

Senator KITTREDGE. Before you reach that point, you are now describing the plan adopted for comparison?

Mr. PARSONS. I am now describing the plan adopted for comparison. If I were to build a lock canal, that is the lock canal that I should prefer to build; I would separate my locks. I would have one lock only at one place, so that if a vessel should go bucking through, the damage to the canal would be minimized, and the repairs could be made in very much less time.

The CHAIRMAN. How many locks would you have?

Mr. PARSONS. I would have two on each side. I would have one lock in the neighborhood, say, of Gatun, and one lock in the neighborhood of Bohio, lifting 30 feet each. Then, on the other side, I would have a lock in the neighborhood of Pedro Miguel and a second lock on the shores of Panama Bay with a summit level of about 60 feet.

Senator ANKENY. Mr. Parsons, as a factor, what has the wind to do with this flight of locks? You have considered that, of course—the matter of inland winds; are they not going to make it difficult to operate those locks?

Mr. PARSONS. Yes; of course, blowing —

Senator ANKENY. I do not see any report upon that.

Mr. PARSONS. It has not been touched upon.

Senator ANKENY. Is it not very dangerous? Is it not a fact that one of the accidents to these ships that you spoke of was caused by a wind?

Mr. PARSONS. One of them was caused by a gale.

Senator ANKENY. Why have you not considered that matter?

Mr. PARSONS. The majority condemns those locks in toto. I want to say again, and I will take every opportunity of saying it, that I think those locks are thoroughly dangerous.

Senator ANKENY. But is it not a serious matter otherwise? What velocity of wind would suspend your total operations up there in the flight of locks, for instance?

Mr. PARSONS. I do not think you could get a wind up there that would suspend the total operations. It would interfere with the operation of the locks; it would delay matters very much, and might cause an accident.

Senator ANKENY. A 50-mile wind would stop you entirely, would it not?

Mr. PARSONS. I would not like to say it would stop the operation entirely. I would rather say it would interfere very seriously. That lake is sufficiently near the Atlantic Ocean side to get the full blasts of a "norther" howling across there, and in the case of a big steamer approaching a lock with a gale on which would be striking her broadside, or would be glancing off from one of those hillsides, it would make her steer wild, especially at low speeds, and would very seriously interfere with and delay the working of the canal.

Senator KITTREDGE. Was the plan proposed by the minority considered in the Commission?

Mr. PARSONS. The three-lock plan?

Senator KITTREDGE. Yes.

Mr. PARSONS. Yes. They proposed, as you will see by referring to the report of the committee on lock canals—we had three committees on plans arranged, one on sea-level plans, one on lock plans, and one on unit prices. The committee on lock canals submitted four projects to the Board. Project number one contemplated—and I am now reading from the report—"a summit level, at an elevation of 85 feet, to be maintained by a flight of three locks at Gatun on the Atlantic side, and with one lock at Pedro Miguel, and two locks in flight at Sosa Hill, adjoining La Boca pier on the Pacific side."

Now, that was voted down by the Board.

Senator KITTREDGE. What was the verdict?

Mr. PARSONS. The committee itself made no recommendation, as

they were divided. I think we voted on that question something like 9 to 4. We voted that plan down.

Then we adopted, by a vote of 8 to 5, an elevation at plus 60; and in the minority report itself you will find that General Abbot, although he signs the minority report, dissents from this particular arrangement; so that there is a dissenting vote in the dissenting report.

Senator KITTREDGE. So, of the 13 members of the Board of Consulting Engineers, 4 favor the Gatun dam as proposed by the minority, with a flight of three locks?

Mr. PARSONS. Yes; General Abbott dissents from that.

Senator KITTREDGE. When did you first see the report of the minority as presented to us?

Mr. PARSONS. On January 31, the last day on which the board met.

Senator KITTREDGE. And until that time you had no knowledge of the exact plans that they would propose?

Mr. PARSONS. Only in general. I knew that they were going to revert to the project No. 1, which the board had previously rejected, and I am now referring to their minority report, where they state:

"This is recommended for adoption"—

That is to say, the minority plan now under discussion—

"This is recommended for adoption, General Abbot preferring a lower dam with duplicate flights of two locks at Gatun, supplemented by a dam and duplicate single locks at Bohio, raising the summit level to elevation 85, as before."

In other words, General Abbot does not favor the three locks in flight.

Senator KITTREDGE. The report of the majority had been prepared long prior to that date?

Mr. PARSONS. The minority waited for the majority to prepare its report first, and then wrote the minority report without consultation with the majority, of course.

Senator KITTREDGE. And for that reason in the majority report, as I understand, you did not discuss the subject which you are now speaking of, or were speaking of in answer to Senator Ankeny's question?

Mr. PARSONS. No; we rejected the whole thing, and voted for a low lock at Gatun. I will say, in regard to Senator Ankeny's question, that among ourselves we considered the very question that he raised—that is to say, the question of the wind.

Senator ANKENY. But it never was made of record?

Mr. PARSONS. It never was made of record; no. We discussed among ourselves the question of the wind and the effect that it would have upon a ship in a lock 85 feet up in the air within a mile or two of the shore of Limon Bay, where they undoubtedly would get the full force of an ocean gale; and that was one of the reasons for which we rejected the idea of the high-level canal.

Senator ANKENY. But you never set that up in your argument?

Mr. PARSONS. No; this report does not contain all our reasons.

Senator ANKENY. But you looked a little farther than the danger to the ship up in the air there, as you expressed it, 80 feet or more? Is there not a danger to your lock with that immense ship there?

Mr. PARSONS. Senator, we regarded the question of the safety of the canal rather than of the ship itself. In other words, you have now called attention to the views that the majority expressed.

Senator ANKENY. You say that there is great hazard to the ship; but is there not a great hazard to your canal—your locks?

Mr. PARSONS. That is what I have been harping on all along.

Senator ANKENY. But you said the ship.

Mr. PARSONS. I know I said the ship in the first place, because I thought you were referring to the ship, but what we regarded on the question of danger is not so much the particular ship as the danger to the canal.

The United States Government is going to own the canal, and I do not dispute the point that the minority make as to there not being much difference in the danger to the individual ship from Colon in a waterway 150 feet wide, as against the danger to a ship in a canal having locks, with a very much wider waterway between the locks. In other words, it is said that the insurance companies insuring a vessel going through the Panama Canal would probably charge as much insurance for a vessel going through at sea level as they would for one going through the lock canal, and I think there is a good deal in that argument. I am perfectly willing to concede it.

But that does not cover the danger to the canal; and I think you are quite right in the point that you have just made, that the danger to the canal is the important thing, and that the danger to a ship from collision is a comparatively small affair. The vessel might sink; the canal might be blocked for a few days, as here in the recent case at Suez, where a vessel loaded with dynamite was sunk, and I think the canal was blocked for nine days. The ship, of course, was a total loss; but the canal was not damaged.

We are interested here in providing, it seems to me, a canal that should be so far as possible danger proof. In other words, a canal subject to short delays would be a permanent structure, and I do not think a canal laid out with three locks in flight is a permanent structure. The day is coming when those locks are going to be carried away.

Senator ANKENY. Is there not another factor there, necessarily, that those men will not go into those difficulties when the barometer indicates that they are coming on, or something of that sort? Will there not be great delays on that account?

Mr. PARSONS. I think so.

Senator ANKENY. Will you have those delays (which will be important when the shipping increases there as we anticipate it will) in the sea-level proposition?

Mr. PARSONS. No. I spoke a moment ago about the delays in the locks. Now, for instance—

Senator ANKENY. Just let us confine ourselves to this wind issue first. Will the sea-level canal have those delays that necessarily will exist in the lock system?

Mr. PARSONS. No, sir.

Senator ANKENY. From winds?

Mr. PARSONS. No, sir; a vessel once in past the breakwaters at Limon Bay can proceed right through the canal.

(At this point it was suggested that the committee adjourn until to-morrow morning at 10.30 o'clock.)

The CHAIRMAN. Now, gentlemen, Mr. Parsons has given us his opinion in regard to this matter in such a way that there is no misunderstanding his position in reference to it. I do not know whether

we want to detain him any further or not. I certainly understand Mr. Parson's position. If other Senators would like to have him stay over and come before us to-morrow at 10.30, of course we will ask him to do so.

Senator TALIAFERRO. Mr. Parsons, have you stated all that you wish to put before the committee?

Mr. PARSONS. Why, Senator, I am at the service of the committee. I have put myself on record in signing the report. I have placed my views in that report, and if the committee want to go ahead and examine me as they have been doing this morning I will come back this afternoon, or I will stay here until to-morrow. I am entirely at the service of the committee. It is for you gentlemen to say what you want to do with me.

Senator KNOX. You have nothing yourself that you wish to volunteer in addition to what the report contains, as I understand, but you are willing to illuminate the report by further explanation if desired?

Mr. PARSONS. I am willing to illuminate the report by any explanations you gentlemen would like to ask for.

Senator KNOX. But the report shows your whole position?

Mr. PARSONS. I stand by the report. I stand by the report, and stand against the minority report. In the first place, the structure proposed is not, in my judgment, a safe one. In the second place, it does not comply with the requirement of Congress that it should be able to take not only the largest existing vessels, but such increase in the size of vessels as can reasonably be foreseen.

Senator ANKENY. You are too good a logician, Mr. Parsons, to attack all these matters without suggesting a remedy. You say these things are dangerous. Now, you have a plan that you consider not so dangerous?

Mr. PARSONS. Yes, sir.

Senator HOPKINS. That is set forth in the report of the majority?

Mr. PARSONS. That is set forth in the report of the majority. If you are going to build a lock canal—the Chairman asked me, if I may take up your time one moment, Mr. Chairman—

The CHAIRMAN. Certainly, Mr. Parsons.

Mr. PARSONS. You asked me a question about what I would do. I say that if you were going to build a lock canal I should prefer the lock canal that I voted for in the Board—namely, one with single locks.

The CHAIRMAN. Yes.

Mr. PARSONS. Of course there is another type of lock canal which was advocated in the Board which does not appear on the record, about which Professor Burr himself made a suggestion, as I see, in his testimony—namely, the possibility of putting locks immediately adjacent to the Culebra Cut. In other words, that plan contemplates building the sea-level canal from both ends just as far as you can build it, until you strike the rise of the mountains, and then putting locks there.

If you are going to build a lock canal with a view to its subsequent transformation into a sea-level canal, that is the kind of a lock canal to build. While it is a lock canal it will not be as good a lock canal as the one that I have just referred to, which represents the views of the majority of the Board—namely, a 60-foot level with a certain amount of lake space. There is an advantage in having lakes.

The CHAIRMAN. Mr. Parsons, right there do you think that a lock canal built on the idea that you suggest, with four locks, could be

built for the same amount of money as that recommended by the minority.

Mr. PARSONS. No, sir; it will cost you more money. The estimate is given in here, I think, at \$175,000,000 or \$176,000,000. It will cost you more money, but it will be a very much better canal.

Senator TALIAFERRO. You mean more money than they estimate?

Mr. PARSONS. No, sir; the estimate is given here at a cost, I think, of \$176,000,000.

Senator TALIAFERRO. I say, you say that that canal will cost more than the canal of the minority?

Mr. PARSONS. Oh, yes; it will cost more than the canal of the minority.

Senator TALIAFERRO. Do you mean that it will cost more than that canal will cost, or more than it is estimated that that canal will cost? Professor Burr thought that canal would cost more than they estimated, including the purchase of these submerged lands.

Mr. PARSONS. Oh, none of these estimates include the submerged lands at all. I am afraid of that submerged land question. As I said a few minutes ago, I think those submerged lands will run the cost to very extravagant figures. I think that the minority will be very much surprised, and I think that the United States Government will be very much disappointed in the cost of those lands; and therefore the lower level plan would diminish the amount of land to be taken.

(The Committee thereupon adjourned until to-morrow, Wednesday, March 14, 1906, at 10.30 o'clock a. m.)

ISTHMIAN CANAL.

COMMITTEE ON INTEROCEANIC CANALS,
UNITED STATES SENATE,
Washington, D. C., Wednesday, March 14, 1906.

The committee met at 10.30 o'clock, a. m.

Present: Senators Millard (chairman), Dryden, Hopkins, Knox, Ankeny, and Morgan.

STATEMENT OF WILLIAM BARCLAY PARSONS, ESQ.—Continued.

Senator KITTREDGE. Mr. Parsons, during the hearing yesterday some member of the committee asked you to prepare, if you found time, a map showing the condition of the hill in the vicinity of the Gatun locks as proposed by a minority of the consulting engineers. Have you prepared such a map? .

Mr. PARSONS. I have, sir.

Senator KITTREDGE. Will you produce it and explain it to us?

Mr. PARSONS (producing map). The map which I laid before the committee yesterday was plate 11 of the report, showing the Gatun dam and the three locks in flight, all shown in red; and I think it was Senator Dryden who asked me if I would make a section of the hill. The Gatun dam is shown in red, with the three locks shown in series at the side of the dam. The black lines indicate the contours of the hill, and you will see that the approach works on the south end, the lake end of the locks, are brought right out to the very edge of the hill; and, in fact, the center guide wall projects over the side of the hill, and it is that that Mr. Bates referred to in his testimony that the approach wall would have no support at all. Of course he meant by that that you would have to put in a very deep support. It would not have a natural support, and you would have to build down to the ground.

Senator MORGAN. Which plan is that?

Mr. PARSONS. This is the minority plan. This is in answer, I think, Senator, to a question that was asked after you had left the room yesterday. Senator Dryden, I think it was, asked if I would prepare a section through that hill showing just how those three locks lay with respect to the hill. The locks are fixed at this end, and the head works project right out to the very edge of the hill. I have drawn here, in a great hurry, since the meeting yesterday, a section of the hill as taken from the official topography and the borings that were made on the site. The details of those borings are given in other plates in the report.

Senator KITTREDGE. How many borings were made in the Gatun Hill in the vicinity of where the locks are to be placed?

Mr. PARSONS. There were nine borings made, I think, Senator, on a different location. This map shows them. There were seventeen borings made altogether, and it was figured at that time that the locks should take that direction, as you can see by these black lines [indicating on map].

Senator MORGAN. The seventeen borings were on the lock site?

Mr. PARSONS. On that lock site; not on the lock site that was finally adopted. The seventeen borings were made on the first lock site as proposed by the committee. Then they found that the hill in that direction was too short to accommodate the locks, and the location was therefore changed from the black lines to the red lines, as indicated on this map, in order to get a longer run of hill, so that these borings down here [indicating on map] give no information at all as to the condition of the lock farther to the east. Therefore, as a matter of fact, there are four borings, or three really, that come within the lines of the lock, as shown by the minority report.

Senator MORGAN. The official location is indicated by those three red lines?

Mr. PARSONS. The official location is indicated by the three lines, and they are outside of the information gathered by the borings; so that there are only three borings that come within the lines of the locks.

Senator HOPKINS. How far out are they, Mr. Parsons?

Mr. PARSONS. That distance is 500 feet [indicating by scale on map]. You can see that all these borings down to the west of the canal, on the lower part, are from 500 to 1,000 feet away.

Senator HOPKINS. From the actual location of the locks?

Mr. PARSONS. From the actual location of the locks. And if you will refer to the plates showing those borings there, given in the report, you will see the indurated clay, for instance, which is the material on which they expect to found the locks, and how it will vary in position between two borings. You see it is liable to fluctuate very widely.

Senator KNOX. It is liable to fluctuate widely within what distance?

Mr. PARSONS. Oh, in a distance of two or three hundred feet it would fluctuate very widely. That is to say, that in order to get anything like an accurate knowledge of the material there on which to found a structure like these locks, borings should be made very close together, as was in fact proposed here. You can see how close the borings were made there [indicating], and on the site of the locks no borings were made at all.

Senator HOPKINS. Before you leave this point, on that map it looks as though those hills run back there, and as though the locks could be run back.

Mr. PARSONS. The ground is too high. If you start to go through that hill, that would be very expensive. You take these locks, as shown in three steps in pencil on this drawing, and if they were to be made a thousand feet long—and these steps are taken exactly from the plan given in the report—you would have to bring the lower ends of the locks down here, in this direction (it is really going to the north, but it is low, so far as the elevation of the ground is concerned); they would have to be moved down here some 750 feet, and you would get 2,000 feet away from the last boring, which is this one [indicating]; and there is no knowledge at all as to what the hill contains there.

So, whether you would get any foundations for the lock at the north end, there is no information at all.

I should like to state, however, that this is in answer to the questions that were asked me yesterday in respect to Mr. Bates's testimony, and that my own belief is that those locks can probably be constructed. I am not attacking the ability to construct those locks at all. I want to have that distinctly understood. But at the same time, if the locks are built, when they are built they will be unsafe for operation, in my opinion, as I explained yesterday. In other words, I lay stress not upon the inability to construct the locks or the inability to make those locks 1,000 feet long if necessary. I believe that the ground is probably there to build the locks on, and that the locks can be built a thousand feet long if it is necessary, but that if that is done you will still have locks that are unsafe to operate, on account of the locks being in series of three.

Senator MORGAN. On the plan laid down or proposed by the minority of the committee and also by Mr. Bates for a dam at Gatun, they correspond, as Mr. Bates stated, precisely in the axis of the dam. I wish you would describe the country as it is now, lying between the abutments of that dam. What is the width between the abutments of the dam across there?

Mr. PARSONS. Senator, I shall have to scale that on the map, because I do not carry those figures in my mind. [After measurement on the map.] The valley across which this dam is to be thrown is flanked on two sides by the hills, as shown on the plan here, with a hill in the center, like an island, so that there will be really two dams. Although the structure will, of course, run clear through from hill to hill, as a matter of fact it really becomes two dams. It is about 7,000 feet from one end of the dam to the other.

Senator MORGAN. Is the opening that is to be closed by the dam there by Mr. Bates or the minority of the Commission—

Mr. PARSONS. Mr. Bates does not propose as high a dam as that. Consequently—

Senator MORGAN. I understand; but that is the area that is to be inclosed?

Mr. PARSONS. No; Mr. Bates wants to put his dam farther to the north, Senator. He proposes to close the valley nearer the Limon Bay.

Senator HOPKINS. He has two dams?

Mr. PARSONS. Yes, sir. He has a smaller dam in here [indicating on map]. His main dam he puts down here [indicating on map].

Senator MORGAN. He stated that the axis of his dam across the Chagres River was the same as that of the minority of the committee.

Mr. PARSONS. If Mr. Bates said so, of course he knows his own plans. He puts a subsidiary dam at Gatun. His main dam he puts down below.

Senator MORGAN. His dam was much lower than theirs?

Mr. PARSONS. Yes, sir.

Senator MORGAN. I want to get at this: I suppose that from the eastern side of the Chagres River a ridge breaks in—an upland?

Mr. PARSONS. Yes, sir.

Senator MORGAN. When you arrive at the Chagres River or in the vicinity of it, does that ridge show a rock front?

Mr. PARSONS. No.

Senator MORGAN. There is rock in that ridge east of the Chagres River?

Mr. PARSONS. Probably; but if you will refer to these borings you will see that you strike a very hard clay, called indurated clay. It is a clay that looks like a rock, but it is not a rock.

Senator MORGAN. I am speaking now of the shores, the coast of this depression.

Mr. PARSONS. There is no rock outcropping that I have ever seen.

Senator MORGAN. There is no rock in the entire extent of that ridge that runs in the direction of the Chagres River from the east?

Mr. PARSONS. I have never seen any rock there.

Senator MORGAN. Is there any in the next hill or mountain or whatever you please to call it?

Mr. PARSONS. I believe not.

Senator MORGAN. Is there any in the second ridge that you strike coming across?

Mr. PARSONS. There on the west side?

Senator MORGAN. Yes.

Mr. PARSONS. Yes; in cutting through the diversion of the Chagres River they showed up rock on those hills over there.

Senator MORGAN. In this interval there have been borings made along the axis of the canal proposed by the minority down to the rock?

Mr. PARSONS. They have gone down to what they call an indurated clay. They have not developed the rock in the line of that dam in the bottom of the geological valley there.

Senator MORGAN. Does anybody know whether that indurated clay has a foundation upon rock?

Mr. PARSONS. I do not think it is known. I suppose it has a foundation on rock somewhere, but they have not gone through the indurated clay to find it.

Senator MORGAN. They have gone 285 feet?

Mr. PARSONS. Yes, sir.

Senator MORGAN. Without striking rock?

Mr. PARSONS. Without striking rock. They ran through clay, clay and wood, and clay and sand.

Senator HOPKINS. Did they go down 285 feet or 258 feet?

Mr. PARSONS. Two hundred and fifty-eight feet, I think it is.

Senator MORGAN. Two hundred and fifty-eight feet; yes. I had the figures reversed. So far as the engineers know there is no rock foundation underneath that indurated clay. The whole dam rests upon that foundation of indurated clay.

Mr. PARSONS. No, Senator. The whole dam would rest upon the material overlying the indurated clay, because they do not propose to go through the overlying material to the indurated clay.

Senator MORGAN. It rests upon the indurated clay and the mass that lies above it, then?

Mr. PARSONS. Precisely. And they propose simply to remove the loose top soil and then make an earth dam directly on that material.

Senator MORGAN. Do these borings indicate that they pass through soft material and through wood before they reach the indurated clay? Is that true?

Mr. PARSONS. That is true.

Senator MORGAN. What is the depth of the mass that lies above the body of indurated clay to the surface of the water, or near to it, we will say?

Mr. PARSONS. The deepest hole that was found on the line of the canal was 258 feet below water level.

Senator MORGAN. And that only reached the indurated clay?

Mr. PARSONS. That only reached the indurated clay.

Senator MORGAN. The balance of it, then, is this mass of matter that is composed of various descriptions of material?

Mr. PARSONS. Yes; I will read the materials shown by the borings. [Reading:] Sand and clay —

Senator KITTREDGE. From what plate are you reading?

Mr. PARSONS. Plate 12 [reading]: "Sand and clay; clay and wood; clay; sand, shells, and wood; sand and shells; sand and gravel."

Senator MORGAN. At Bohio, and perhaps farther down the course of the river, the engineers who have heretofore explored this region with boring drills and implements have discovered what they call a geological gulch or "V?"

Mr. PARSONS. Yes, sir.

Senator MORGAN. Is that same gulch discoverable or has it been discovered at the site of the Gatun dam, that is proposed by the minority of the committee?

Mr. PARSONS. Yes, sir. If you will refer to plate 12 you will see that gulch shown there in the lower profile [showing profile to Senator Morgan].

Senator MORGAN. How do they know it is there unless they have bored down to it?

Mr. PARSONS. They have bored down to it. I was just reading the materials obtained from the borings there lying above the indurated clay. There is the gulch there [indicating on map].

Senator MORGAN. That gulch is formed in indurated clay and not in rock?

Mr. PARSONS. Yes, sir; in indurated clay and not in rock.

Senator MORGAN. And there is no rock basis there for that gulch?

Mr. PARSONS. It has not been found.

Senator MORGAN. But an actual rock basis for that gulch has been found at Bohio?

Mr. PARSONS. Yes, sir; they found the rock there.

Senator MORGAN. So that, between Bohio and Gatun, there is as yet no development by the borings that have been made of the extension of that geological gulch formed in the rock in the direction of Gatun?

Mr. PARSONS. The borings do not show the depth of the rock. At Gatun the borings were put down until they struck that indurated clay, and then stopped.

Senator MORGAN. I notice a precipitous figure there on that profile—a sort of gulch.

Mr. PARSONS. Yes, sir.

Senator MORGAN. That means, if I understand it, that the indurated is found, for instance, at this level on this side [indicating on profile] and at this level on this side [indicating]?

Mr. PARSONS. Which is about 25 feet above sea level.

Senator MORGAN. And on this side it is not found until you get to the bottom of this boring [indicating on profile]?

Mr. PARSONS. That is correct; 258 feet below sea level, or a total drop of 285 feet.

Senator MORGAN. This bed of indurated clay may be stated to form the walls of this gulch in here [indicating on profile]?

Mr. PARSONS. That is correct.

Senator MORGAN. I have inquired of a man that I have a great deal of respect for as an engineer, and I think he is as great a man as any in the world in that regard, and I want to read to you his criticism upon that situation, just to see whether you concur in it or not. I will not give his name. I do not feel at liberty to do it, because I asked him for his opinion (reading):

"I can not reconcile myself to the proposition of resting the enormous interests involved in the proposed waterway on the problematical stability of an experimental earth dam resting on river silt 258 feet deep; and I believe that many engineers will agree with the majority of the board in doubting the impermeability claimed for a soil composed of silt, shells, sand, clay, decayed wood, and other débris brought down by the river and promiscuously deposited, when subjected to a pressure of 85 feet depth of water. That no appreciable leakage will take place under the dam is at best a matter of opinion, which can not be proved by mathematical computations or by established engineering experience. That highly compressive soil must sink to a great extent under the weight of the embankments, amounting to 7 or 8 tons to the square foot, exclusive of the weight of the water.

"The settlement will continue for a number of years, and will be unevenly distributed in the deep gorges and in the dam as a whole, by reason of lack of uniformity in the sustaining subsoil. As the gorges are confined by nearly vertical rocky cliffs, extending to great depths, breaks or disintegration must be expected in the embankment at the crests of these four cliffs, that position of the embankment, resting on solid ground remaining practically stationary, while the sections on top of the gorges slide down along the rocky walls. Such disturbances must cause breaks in the dam at those points, through which a stream of water, very small at first, may find its way, and which all engineers know will, under the proposed head of water, end in a disastrous breach in the dam.

"A failure of the dam by such natural processes as here described, or the destruction of the controlling works of the flight of locks by the fire of an enemy's ship from 4 miles at sea, would precipitate a tidal wave of enormous power of destruction to the canal and whatever may be found between those works and the sea. It is true that with a lake of 108 square miles of superficial area, as is proposed to be created by dams projected at both ends of the canal, the flood waters can be kept under control so far as violent fluctuations of level and gradual discharge of the surplus water are concerned, but cross currents, silting up, and changes in location of the navigable channel must be expected, and the high speed in vessels through the locks estimated in the report will, in my opinion, prove more theoretical than practical. This objection applies with greater force to that portion of the lake between Obispo and the Gatun locks, a distance of 23.5 miles, in which the highest speed and freedom of navigation are expected to be attained."

That is as much of that letter as I desire to read to you. I wish to know to what extent, if any, you concur in those opinions.

Mr. PARSONS. I concur substantially in the whole of those opinions. Senator, as indicated by my vote on the Board when I voted against the Gatun dam and against the flight of three locks. As I said yesterday, I consider that arrangement a very dangerous arrangement.

Senator MORGAN. I wish to state that this is from a gentleman who has no connection with any of those plans.

Mr. PARSONS. There is one point in his letter that I would like to call attention to. He speaks about whether that material was permeable or not. I think that this committee has before it a blueprint showing all the data connected with these holes which, by some accident, was left off of plate 12, in which water flows from those holes and above the surface of the ground, indicating not only that there is water there, but that there is water there in motion; otherwise of course it never could flow out of the tops of the holes.

Senator MORGAN. Did the water that came out of those pipes flow continuously in the borings through what is called the indurated clay?

Mr. PARSONS. No, sir; there were no borings made through the indurated clay.

Senator MORGAN. Only into it?

Mr. PARSONS. The flow came from the material overlying the indurated clay.

Senator MORGAN. So that there is nothing to show that the indurated clay is permeable?

Mr. PARSONS. The indurated clay is undoubtedly impermeable.

Senator MORGAN. All right.

Mr. PARSONS. But the material lying above the indurated clay is not, and water flowed from a number of these holes, as you can see by this map, Senator [indicating on map].

Senator MORGAN. These are the holes the water flows through [indicating]?

Mr. PARSONS. Yes, sir. This profile that you have before you is the original paper that was sent from the Isthmus to the Board of Consulting Engineers, of which plate 12 is a partial copy.

Senator MORGAN. The water flows through these borings?

Mr. PARSONS. It is marked on here where the water was found. For instance, there was water found at that point in that hole [indicating], and at that point in that hole [indicating], and therefore in that particular hole water flows from two different strata.

Senator MORGAN. But in like manner?

Mr. PARSONS. The profile indicates all these holes where the water is coming from and in nearly every hole water flowed up over the top of the pipe. In other words, it indicated that there was water in all this sandy strata and water under pressure sufficient to make it rise to above sea level.

Senator MORGAN. Here is a very close correspondence between this level [indicating on profile] and this [indicating].

Mr. PARSONS. Yes.

Senator MORGAN. Where water was discovered.

Mr. PARSONS. Yes.

Senator MORGAN. But in the interval is a ridge, I will call it, an uplift or ridge, of the impermeable material?

Mr. PARSONS. Yes, sir.

Senator MORGAN. Is there any impression amongst the engineers that the water that appears here and the water that appears here and the water that appears here [indicating on profile] is the same?

Mr. PARSONS. It is undoubtedly the same, meeting higher up. This block of indurated clay is probably a geological island, and those two

gorges that you see on this profile probably join at some point to the south of that island. For instance, you can see the same thing topographically on this map on the wall as appears geologically on that map there. Here is this island, in between these two streams [indicating on map]. Geologically, beneath the surface, you have practically very much the same arrangement as above the surface there.

Senator MORGAN. It is therefore possible, if not probable, that the water that is found coming into the tubes at about the same elevation in each side of this ridge is the same water connected beneath an island, if I understand you?

Mr. PARSONS. Undoubtedly the same water.

Senator MORGAN. So that from this point to that point [indicating on profile] there is some current of water passing underneath that permeable material?

Mr. PARSONS. Passing around. It does not go underneath the permeable material. It does not go through the impermeable material, but it goes around it. They probably both have the same source, namely, the water in the Chagres River at some point higher up the valley, so that that material is permeable.

Senator MORGAN. In basing a dam upon this impermeable material you would necessarily have to make provision to prevent this flow of water that goes around it and appears at the same level on either side of it? You would have to provide against that?

Mr. PARSONS. The minority does not propose to provide against that; and, in fact, it is impossible to provide against the undercurrent of water in that permeable material.

Senator HOPKINS. In your judgment, would it be necessary to do so?

Mr. PARSONS. It would be very desirable to do so, Senator. I would rather put it in that way. It would be very desirable.

Senator HOPKINS. The tendency of time is to fill these pockets with the material that comes down the Chagres River, is it not?

Mr. PARSONS. They have not been filled so far, Senator.

Senator HOPKINS. Is not the fact that these are pockets and that you have this island that you speak of an evidence of the fact that it is being filled?

Mr. PARSONS. No, sir. That indurated clay is not working out. The probabilities are that that hole was indurated clay at one time and the river has dug out those pockets; that the river has been flowing down there. That has undoubtedly been washed out. Then there is some general subsidence of the surface of the ground. The whole country has gone down, and, as it went down, the river has filled up these pockets, which it had theretofore excavated, in some previous geologic period, and it has filled them up with such loose material as it had at hand to bring down. Therefore it has filled them up with clay, gravel, wood, and so forth.

Senator HOPKINS. The tendency is to solidify that material in those pockets all the time, is it not?

Mr. PARSONS. I do not think so.

Senator DRYDEN. Would it not be possible to divert this water which flows down into these pockets at some point above, so as to make another disposition of it?

Mr. PARSONS. No, sir; you can not cut that off. The whole Chagres Valley has a great geological valley on its own bottom, just like that, and that extends all the way up to the main divide.

Senator MORGAN. I have a single question to ask, and I should like to ask it, and then turn the witness over to my colleagues.

You say, Mr. Parsons, that is the base of the dam, is it, or about there [indicating on map]?

Mr. PARSONS. Yes, sir.

Senator MORGAN. It is impossible in the construction of that dam to fill up these channels, that appear on both sides of that geological island, so as to stop the flow of the water?

Mr. PARSONS. Practically impossible.

Senator MORGAN. Is it probable that that same channel will fill up by the silt that comes out of the water of the river?

Mr. PARSONS. No, sir; I do not believe that those underground channels will ever close up.

Senator MORGAN. So that they will remain there?

Mr. PARSONS. I think so.

Senator MORGAN. You will have to build your dam with the expectation of their remaining there?

Mr. PARSONS. Yes, sir; and a certain amount of water will always pass beneath that dam.

Senator MORGAN. With an 80-foot head of water, or a great head of water above that at the dam, would not the flow through those channels be very much increased?

Mr. PARSONS. Undoubtedly.

Senator MORGAN. And there would be great pressure there?

Mr. PARSONS. Undoubtedly.

Senator MORGAN. Would not that be an element of threat or danger to this dam always?

Mr. PARSONS. Undoubtedly.

Senator KNOX. Right in that connection, because it is a part of the same subject, is there a sufficient amount of water, in your judgment, flowing through those channels to affect the stability of the dam?

Mr. PARSONS. As I said yesterday, Senator, I believe that dam will be stable, even under those conditions. It is a dam that I would rather not build, but if it was the only way to build the Panama Canal I would build the dam that has been proposed by the minority. I do not believe in the arrangement of the dam, and the most objectionable feature is the one I explained yesterday in connection with the three locks.

Senator KNOX. I understand that view thoroughly. I only wanted to be satisfied in my own mind about the question of stability.

Mr. PARSONS. I believe that the dam will be stable. It is somewhat conjectural, but I believe that with proper care the dam would be stable—

Senator MORGAN. How could that geological island exist in there except by being separated from a former continuous body of impermeable or indurated clay, of which it is composed? How could it exist there except by some convulsion of nature, or the washing of the water around it?

Mr. PARSONS. It was probably made by erosion, Senator.

Senator MORGAN. By the erosion of the water?

Mr. PARSONS. By the erosion of the Chagres River.

Senator MORGAN. That is the probability?

Mr. PARSONS. Yes, sir.

Senator MORGAN. As long as the erosion kept up the danger would be there, whatever it may be?

Mr. PARSONS. But when that erosion took place it is also probable that the surface of the ground was quite different from what the surface of the ground is now.

Senator MORGAN. I suppose nobody knows whether that indurated clay is a deposit from water or whether it is the original formation of the earth there?

Mr. PARSONS. I would not like to express any opinion on that.

Senator MORGAN. Nobody knows?

Mr. PARSONS. I do not want to say what anybody else knows. I do not know, Senator.

Senator MORGAN. You do not know? You have thought over this subject?

Mr. PARSONS. I have.

Senator MORGAN. And you can not inform this committee whether that body of impermeable or indurated clay is a part of the original structure of the earth or whether it has been deposited there by the action of the water?

Mr. PARSONS. Probably, like all clays, it is a matter of deposit in water.

Senator KITTREDGE. Mr. Parsons, I would like to ask you about the Gamboa dam, whether in your judgment it is an entirely safe structure, and whether its construction involves any unusual or untried engineering problems?

Senator HOPKINS. Point out Gamboa on the map there, in the first place, please.

Mr. PARSONS. There is the Gamboa dam, right there [indicating on map]. And that Gamboa dam makes that lake, as indicated in blue on that map.

The dam as proposed at Gamboa is a perfectly safe structure, and it will be built in accordance with well-recognized engineering principles.

Senator KITTREDGE. What advantages, if any, has the construction of that dam in the way of furnishing power for any purpose useful in connection with the operation of the canal?

Mr. PARSONS. The Chagres River is to be controlled by the Gamboa dam, and a certain amount of water will have to be let through that dam always; more, possibly, in times of flood, but there is always a certain amount of water that will have to pass through that dam, and will have to pass through the dam at a considerable elevation. It will therefore be perfectly possible to put a power house there, and, instead of having that water go idly into the river, to let it pass through turbine wheels and generate electricity for use.

Senator KITTREDGE. And what useful purpose will that accomplish?

Mr. PARSONS. There will be sufficient water going to waste through the Gamboa dam to provide power to operate the canal with whatever necessary machinery may be in connection with the canal, as, for instance, the machinery to work the tidal locks at Panama, and to light the canal and the terminal harbors; because if the canal is to be operated by night, the whole length of the canal must be lit. There would be enough power, in addition to that, to operate the Panama Railroad, and, probably, to light the cities of Colon and Panama.

Senator MORGAN. That is a map of the proposed sea-level canal, is it [indicating map on the wall]?

Mr. PARSONS. It is.

Senator MORGAN. I notice that there are several curves between Gamboa and the Bay of Limon which might possibly retard or interrupt to a certain extent the safe and rapid navigation of the canal. Is it practicable within reasonable cost to take out the sharpest of those curves?

Mr. PARSONS. No, sir; it is not, but you must remember that the radius of the sharpest curve is 8,200 feet—more than a mile and a half—and that that curve is very, very much flatter than the curves that are found at Suez, at Kiel, or at Manchester.

Senator MORGAN. Well, the ideal or the really desirable canal is a straight line?

Mr. PARSONS. Certainly.

Senator MORGAN. But you think that the line as projected by the majority of the consulting board, of which that is a map, could not be improved without great expenditure of money?

Mr. PARSONS. Substantially not.

Senator MORGAN. And that there is no necessity for improving it?

Mr. PARSONS. There is no necessity for improving it. You will have a canal on that alignment that will be far more easily navigated than any of the ship canals that have been built in the world to-day, and which are operated with entire satisfaction.

Senator DRYDEN. At the sharpest turn in that canal, how far apart do you think two approaching vessels could see each other?

Mr. PARSONS. I could not answer that question definitely, Senator. It depends upon the local topography; but they would undoubtedly be able to see each other a long ways off, quite far enough off to prevent any possibility of collision.

Senator DRYDEN. A quarter of a mile?

Mr. PARSONS. Oh, yes; they would be able to see each other farther off than that. They would see the masts farther away than that.

Senator DRYDEN. In connection with that point, is this territory down there subject to fogs particularly? Do you know whether that is so?

Mr. PARSONS. Not to any very great extent. I never have seen any fogs there.

In regard to this question of curvature, Senator, about which you were asking a moment ago, I have prepared a little table this morning which I would like to submit in answer to your question, as showing the characteristics of the Suez, Kiel, and Manchester canals, as compared to the proposed sea-level canal. Taking the minimum bottom width at Suez, it is 108 feet; at Kiel it is 72 feet; at Manchester it is 120 feet, and at Panama 150 feet. Depth: Suez Canal, 31 feet; Kiel, 29.5 feet; Manchester, 26 feet; Panama, 40 feet. The radius of the minimum curve at Suez is 6,561 feet; at Kiel, 3,282 feet; at Manchester, 3,100 feet; at Panama, 8,200 feet.

At Suez there are seven curves which have a radius less than the minimum radius as proposed by the majority. Therefore you will see that the bottom width at Panama is 50 per cent greater than that at Suez, while the depth is 30 per cent greater and the minimum curve is 40 per cent greater. I think it is well to keep Suez in mind, because there is a canal which has been operated, now, for a great many years, and you can see that the dimensions which have been given by the

majority in the sea-level plan are vastly in excess of the similar dimensions as found at the Suez Canal.

Senator KITTREDGE. I was about to ask you, Mr. Parsons, what great dam you are now engaged in constructing?

Mr. PARSONS. I am consulting engineer and chairman of the board of engineers building a dam at McCalls Ferry, across the Susquehanna River, and preparing plans for a second dam across the same river immediately below that. The dam has a length of about 3,000 feet on the crest, and with a head of about 75 feet, all in masonry. As compared with the Gamboa dam, it is a very much larger structure; and comparing the Susquehanna River, with which, of course, you are all very familiar, with the Chagres River, the Susquehanna River has, in times of flood, ten times the maximum flood that has been known to pass the Chagres at Gamboa. There has been a flood in the Susquehanna of over 700,000 cubic feet a second. Floods of 500,000 feet a second are quite common.

Senator KITTREDGE. Where on the Susquehanna is the dam you have mentioned?

Mr. PARSONS. At a place called McCalls Ferry.

Senator KNOX. And where is that?

Mr. PARSONS. About 40 miles up the river from Havre de Grace.

Senator KNOX. Oh, yes.

Senator KITTREDGE. Yesterday we were discussing, as the adjournment was taken, the question of the speed of ships—

Senator HOPKINS. Before you leave that, are there any locks connected with that dam that you were just speaking of?

Mr. PARSONS. No, sir; that is simply a dam for power purposes.

Senator HOPKINS. For storing water?

Mr. PARSONS. For storing water for power purposes. I did not mention it yesterday when I was giving my autobiography. The Senator asked about that dam, I presume, in comparison with the Gamboa dam.

Senator KITTREDGE. Yes; that was the purpose.

Mr. PARSONS. The difficulties in damming the Susquehanna River are far greater than those of damming the Chagres River.

Senator ANKENY. Has that dam that you are building across the Susquehanna a stone core with earth filling?

Mr. PARSONS. No, sir; that is an all-masonry dam, because the whole river will have to pass over the top of that dam at times of flood.

Senator ANKENY. This dam that you contemplate has what you call a stone core?

Mr. PARSONS. At Gamboa?

Senator ANKENY. Yes.

Mr. PARSONS. The estimates that were made are sufficient to cover either an all-masonry dam or a dam with a masonry core and earth on both sides. In either case, the main part of the dam would go down to bed rock. In other words, there would be no permeable strata beneath the dam, such as Senator Morgan has described, that will exist at Gatun.

Senator ANKENY. If you had to build a dam, you would build it in that way?

Mr. PARSONS. If you are going to build a dam there, it is the only way that you can build a dam, Senator.

Senator KNOX. What is the area of that restrained water of the Chagres, about?

Mr. PARSONS. Forty-three square miles.

Senator KNOX. And what is the quantity of water that would escape daily? Have you estimated that?

Mr. PARSONS. The average flow of the Chagres River at Gamboa is about 3,000 second-feet; that is the average flow per annum.

Senator KNOX. How is that carried out of the lake? Do you have sluiceways?

Mr. PARSONS. The dam at Gamboa is in two parts. There is the main dam, which will be either all masonry or with a masonry core and earth on both sides, going across the main valley. Then to the north of the valley there is a depression in the hills through which the French have already partially constructed a diversion channel. It is proposed to complete that diversion channel and to put in that depression an all-masonry structure through which the flow of the river would pass.

Senator KNOX. So that under no circumstances would there be an overflow of the dam?

Mr. PARSONS. Under no circumstances would there be an overflow of the main dam. That would be always above water, no matter whether it was built of earth or all masonry.

Senator KNOX. And of course, in order to determine whether this diversion channel is adequate to carry off the surplus water, you have estimated the area of the rainfall, and the amount of rainfall and all that sort of thing?

Mr. PARSONS. Those figures are all given in the report, sir.

Senator KNOX. You remember the disastrous flood at Johnstown?

Mr. PARSONS. Yes.

Senator KNOX. My recollection is that that dam was built upon the theory that the dam was sufficiently high and the diversion channel was of sufficient area to carry away any water falling on that watershed that the records of one hundred years showed to have fallen; and yet that dam, being partly masonry and partly earth, did overflow, and that was the cause of the accident. Now, how far back have they the records of the rainfall on the watershed that supplies the Chagres?

Mr. PARSONS. Substantially fifty years.

Senator KNOX. Can you tell me the formula, how much they have allowed for any excess of the greatest rainfall on that watershed?

Mr. PARSONS. The biggest flood of which there is any record is the so-called flood of 1879, and it is shown that this lake will take two of those floods, one right after the other, passing only the normal amount of water through the sluices. So that you could have two of those floods, one right on top of the other, and still you would not have your lake full.

But by allowing the maximum amount of water to go through the gates that we figured on, you could lower the level of the 1879 flood in the course of a very few days after the flood had stopped and bring the lake back again to normal conditions. But even if the worst should come to the worst, and you should imagine three of those floods piled one right on top of the other and the gates would not carry the water off, then you would have the masonry dam in the diversion channel drowned out and the river would simply go over the top of that.

Senator KNOX. So that under no circumstances —

Mr. PARSONS. Under no circumstances would the water go over the top of the earth dam.

Senator KNOX. But if it did, of course it would cut it out?

Mr. PARSONS. It would cut it out; yes, sir. That you can guard against, and some of the members of the majority of the board thought that in a work of this magnitude it might be well to take that additional precaution by making the main dam a masonry dam, so that if you had four or five 1879 floods, and the whole thing was drowned out, the flood could go over the top of the main dam.

Senator KNOX. I tried those cases arising out of the Johnstown flood, and my recollection is that taking greatest rainfall in one hundred years, and allowing that that would be precipitated upon 8 inches of melting snow, the diversion channel was more than twice sufficient to meet all those requirements, and yet that lake overflowed and caused all that damage.

Mr. PARSONS. The criticism could be met here absolutely by making the whole of the dam a masonry dam to the bottom. We have provided here a sufficient estimate to build an all-masonry dam if it is desired to do so.

Senator DRYDEN. Will you point out on the map about where these diversion channels run and where they empty?

Mr. PARSONS. The diversion channel I am speaking about comes right in here [indicating on map] alongside the dam and would flow directly into the line of the canal.

Senator DRYDEN. Does part of the water from that lake empty into the Pacific and part into the Atlantic?

Mr. PARSONS. The plan is arranged so that the management can let that water flow into the Pacific, if they want to. We have proposed a series of control sluices in the neighborhood of Corozal, so that during the time when the tide in the Pacific is lower than the water in the canal—that is to say, for one-half of the day—the water could be drawn from this lake southerly through the canal and through those sluices into the Rio Grande, and at other times the water would go northerly through the canal to the Atlantic.

Senator ANKENY. Is that water adequate at all times for all necessities of that canal?

Mr. PARSONS. In a sea level proposition no water is needed for the operations at all. You see there are no locks except the tidal locks.

Senator MORGAN. Take the case of a lock canal.

Mr. PARSONS. In the case of a lock canal, then they do not use the dam at Gamboa; but with the dam at Gatun, as you can see by that map, the white and the blue spaces, they make a very much larger lake inland, and use that as their storage reservoir.

Senator ANKENY. Will that be adequate at all times?

Mr. PARSONS. It will be adequate for a very large amount of traffic. The minority has shown that if at any time that fails to supply enough water, a dam can be built higher up the Chagres Valley at Alhajuela, making an additional lake on the upper Chagres, and dams can also, if desired, be put on some of the other tributaries, and so store up enough water to carry through the operation of the locks, even with enormous tonnage, through the dry season.

Senator MORGAN. Take a lock canal about 10 miles in length, between Gamboa and Pedro Miguel or Miraflores, of about the same

dimensions with a sea-level canal that might run on either side of this Culebra ridge, and is there enough water in that lake impounded by the dam, as proposed by the majority, for the regulation of the Chagres River, to supply the canal in full working order between those points that I have mentioned, Gamboa and Pedro Miguel?

Mr. PARSONS. There would be, I believe, Senator, if you put your level as low as 60 feet. I think you would get enough water in the Gamboa Lake to supply enough water for lockage on a 60-foot level, at any rate until your traffic became very, very large, and by that time you would probably have your locks removed.

Senator MORGAN. If you were to build a canal between Gamboa and Pedro Miguel or Miraflores, across the Culebra heights, would you prefer 60 feet, or would you prefer 80 or 85 feet?

Mr. PARSONS. If I were to build a canal there I should figure on establishing my locks on each side of the ridge and then begin to cut, and cut that summit down just as fast as I could cut it down until I met the locks coming up; and I should figure on getting it down to at least an elevation of 60 feet, or possibly less.

Senator MORGAN. Sixty feet or less?

Mr. PARSONS. Yes.

Senator MORGAN. But you think 60 feet would be a safe calculation as to the usefulness of the canal?

Mr. PARSONS. Yes; I think you would have water enough in the Gamboa Lake to supply water for lockages on the 60-foot level for the traffic that could be passing in the immediate future.

Senator MORGAN. You would lock up to it by, say, two locks of 30 feet each, and down the same way?

Mr. PARSONS. Yes, sir.

Senator MORGAN. Is a 30-foot lock considered a dangerous elevation for a great ship canal like this?

Mr. PARSONS. Any locks are a dangerous elevation, Senator.

Senator MORGAN. But is a 30-foot lock extraordinarily dangerous?

Mr. PARSONS. No, sir.

Senator MORGAN. Not nearly so bad as a 45-foot lock?

Mr. PARSONS. No, sir. A 30-foot lock is a lock within reasonable dimensions.

Senator MORGAN. That is what I wanted to get at. That is all.

Senator ANKENY. You speak of increased traffic. What maximum did you consider for the increased traffic? What did you anticipate when you said "enough for increased traffic" or for greater traffic? That, of course, is a term I do not quite fix. What tonnage did you fix?

Mr. PARSONS. I have not fixed any tonnage. In the minority report, where they were obliged to make those calculations—

Senator ANKENY. I saw that; but, in your opinion, what tonnage should be fixed?

Mr. PARSONS. In my opinion, the figures they gave there are a very large tonnage. They were figuring, I think, that the Gatun lock would supply lockages for 50,000,000 tons per annum. I think that they have taken a little too hopeful view of the situation.

Senator ANKENY. You think that is sanguine?

Mr. PARSONS. Yes, sir; I think their figures are sanguine; but then, of course, 50,000,000 tons per annum is an enormous traffic.

Senator ANKENY. What is it in the Soo?

Mr. PARSONS. In the Soo it is 40,000,000 tons, I think.

The CHAIRMAN. You speak of the Soo. A better comparison would be to compare this Panama Canal with the Suez Canal, would it not?

Mr. PARSONS. I would rather compare it with the Suez.

Senator ANKENY. The Suez is an open sea canal, and the Soo is a lock canal. We are figuring on lock canals, and I do not think the comparison would apply.

Mr. PARSONS. So far as the question of operation is concerned; but I understood Senator Millard's question to refer more to the question of traffic.

The CHAIRMAN. Yes.

Senator ANKENY. Oh, I beg pardon.

Mr. PARSONS. It was in that point of view that I gave the answer, Senator.

Senator KITTREDGE. Yesterday, when we were about to adjourn, you were telling us about the speed of ships, and have indicated the additional time necessary to pass through the six locks. At your convenience will you give your figures for that operation?

Mr. PARSONS. The board, on page 50 of its report, stated that the dimensions adopted by the board will permit "a speed of 6 miles per hour for the largest existing vessels using it, and of not less than 8 miles per hour for the average ship." The canal is substantially 50 miles long from deep water in the Atlantic to deep water in the Pacific, of which 40 miles are between shore and shore and with a more or less restricted channel. Take the minimum figures for the average ship of 8 miles per hour—and those figures are based on the experience of the Manchester and Suez canals—and we would have 40 miles at 8 miles an hour, or five hours for the land portion of the canal; and then 10 miles at 10 miles per hour, making an hour more, so that it would take six hours for vessels to travel from ocean to ocean, exclusive of the delays in stopping to get orders, to be measured, to pay duties, and so forth, which are inseparable from any canal and of course entirely independent of type of the canal. It would take six hours of steaming time at the minimum rates, as proved, to go through the canal.

Taking a lock canal on the same basis, and again the length of 50 miles, and there are 12 miles of the restricted channel, and 38 miles of either open sea, dredging or lake navigation, where we will assume the vessel could make 10 miles an hour. We would therefore have for the lock canal 12 miles at 8 miles per hour, or an hour and a half of time consumed, and 38 miles at 10 miles per hour, or three and eight-tenths hours' time consumed. Then, as I showed you yesterday, there would be four hours—a trifle more, but I take four hours—of time lost in going through the locks; making a total time of nine and three-tenths hours in passing through the lock canal, provided, of course, there were no delays. Nine and three-tenths hours' time is slightly less than the minimum time assumed by the minority of the committee, so that that indicates that I have computed that fairly.

In regard to the question of delays, in the sea level canal there would be a delay first in passing the tidal lock which, at the worst, the Board has estimated would take an hour. Inasmuch as half the time that lock will be open, and there will be no delay, and part of the rest of the time the tidal variation will not be at the maximum, so that the hour would be diminished, a half hour would be lost on the average ship at the tidal lock. That would seem to be a reasonable figure. That would

make, therefore, six and one-half hours in going through the sea-level canal and nine hours and, say, one-half, in going through the lock canal, or a difference of three hours in favor of the sea-level canal.

The Board has also stated—and this was written after the experience of the Manchester, Kiel, and Suez canals, and subscribed to by the men who have charge of those canals: "The width adopted for the canal will be sufficient to permit steamers to maintain a speed of 6 to 8 knots per hour and to allow two merchant steamers to pass one another on the line of the canal without stopping." So that all ordinary vessels of commerce will not have to stop in passing through the sea-level canal. They might have to slow down in passing each other. So that, if you will allow half an hour or an hour for the delays in transit passing vessels, you will have from seven to seven and one-half hours of time consumed in passing through the sea-level canal, as against nine and one-half hours in passing through the lock canal. But in the lock canal I have allowed nothing for the delays in vessels passing each other in the 12 miles of restricted channel.

Senator KNOX. Which takes you about as long as it does to get up from Sandy Hook to dock in a fog?

Mr. PARSONS. I think I have spent even more time in that operation, Senator.

Senator KITTREDGE. An advantage of at least two hours?

Mr. PARSONS. An advantage of at least two hours.

Senator KITTREDGE. In favor of the sea-level canal?

Mr. PARSONS. Yes, sir; in favor of the sea-level canal.

Senator KITTREDGE. In this connection I call your attention to the testimony of Mr. Stevens, the chief engineer of the Commission, found on page 255. I will read the question—

"Senator DRYDEN. Can you tell how long it would delay a boat of the largest character that would be likely to go through there to be lifted up and go through one of these locks?"

"Mr. STEVENS. To get through the three locks?"

"Senator DRYDEN. Yes, sir.

"Mr. STEVENS. They ought to go through in from 45 to 55 minutes."

Have you any comment to make upon that statement?

Mr. PARSONS. In saying anything which might be interpreted as a criticism of Mr. Stevens, I should like to say that I noticed in reading the testimony as it appeared, that the first time that you called him he stated that he had explained to the Board of Consulting Engineers, when it was on the isthmus in the autumn, that he had been so busy with other matters that he had given practically no thought at all to the type of the canal; and when you had him before you at your first meeting in Washington—I think you had him before you three times—he stated again that he had given but very little attention to the type of the canal, having been engaged in other matters; and that at that time he had not read the minority report, and had not studied the majority report. That, I think, appears in the testimony.

Senator KITTREDGE. Do you remember the date of that? It was January 16, was it not?

Mr. PARSONS. I think that was the date when he was first called. It is a matter of record here.

Senator KITTREDGE. It is not material. You need not stop to look it up.

Mr. PARSONS. Yes; he was first called January 16, and his second testimony, which is the time you are now referring to, was a week later, on January 23. The second time he stated that in the interval he had read the two reports twice each. So that, as I say, in making what would look like a criticism of Mr. Stevens—I am not trying to criticise—I want to preface it with this statement, that Mr. Stevens practically disclaimed responsibility for definite knowledge.

In speaking of vessels going through those locks in from forty-five to fifty-five minutes, I think that Mr. Stevens misread one of the papers in the appendix to the report, where Mr. Noble and Mr. Ripley showed that the theoretical interval between two steamers in passing through the triple locks would be fifty minutes—that is, fifty minutes after the first vessel had entered the lock it would be possible to introduce a second vessel, but the first vessel would still be in the process of being locked through. And that was the theoretical time. Where everything was to work exactly right.

Working it out on the theoretical time, substantially as laid down by those gentlemen, and then making an allowance of 50 per cent, which is found in the lock canals to be about a proper allowance to make for actual practice, it would take two hours and nineteen minutes instead of forty-five to fifty-five minutes to pass a flight of three locks; and those are the times that have been practically incorporated in the estimate of the minority as to the time taken to go through the canal.

Senator KITTREDGE. On the subject of the passage of large ships through this canal, I call your attention to the statement of Mr. Stevens, found on page 268, where, in answer to a question propounded by Senator Morgan, Mr. Stevens said [reading]:

“Mr. STEVENS. My opinion is that a very large ship could never be assured of getting through a sea-level canal of the dimensions reported without grounding, unless she ran at such speeds as would practically destroy the usefulness of the canal, for this reason: That out of the 49 miles there is over 29 miles that is only 200 feet wide, and you can see from the map that it is more or less tortuous in direction. I think that this situation would be accentuated by the immense number of small streams carrying flood water directly into the canal at the depths that they would, from 30 to 150 or 160 feet. They are constantly carrying in detritus that would make shallow bars that would very soon render the navigation of such a canal impracticable for large ships, and sooner or later for all ships, unless there were a fleet of dredges kept constantly working from one end to the other to keep it open.”

Have you any criticism or comment to make upon that statement of Mr. Stevens?

Mr. PARSONS. The table which I read in answer to Senator Morgan's question a few minutes ago would seem to have bearing on that question. I do not think that Mr. Stevens had fully in mind the dimensions of the Panama Canal as compared, for instance, with the Suez Canal. When he speaks about the narrow channel, he must have overlooked the fact that the sea-level channel is 50 per cent wider than the bottom width of the Suez Canal and it is actually wider than the width of the Suez Canal plus the passing places in addition; also that it has a depth 30 per cent greater, and that its maximum curvature is 40 per cent greater than the maximum curvature of the Suez. In

other words, it is a very much larger canal, and very much less tortuous than the Suez Canal, where vessels are going backward and forward constantly, and have been doing so for a great many years.

Senator HOPKINS. What is the size of the vessels that go through the Suez Canal?

Mr. PARSONS. Of course all types of vessels go through the Suez Canal.

Senator HOPKINS. What are the largest that go through that canal?

Mr. PARSONS. The largest passenger steamer of which I have record was the *Grösser Kurfurst*, with a length of 500 feet, a beam of 62.3, and a draft of over 26 feet. The British battle ship *Terrible*, with a length of 500 feet, a beam of 71 feet, and a draft of 26.4 feet has also gone through.

Senator MORGAN. Those are the largest ships that have yet passed through the Suez Canal?

Mr. PARSONS. They are the largest that I know of; yes, sir.

Senator HOPKINS. There are no streams that flow into the Suez Canal, are there?

Mr. PARSONS. I have never been through the Suez Canal. May I ask General Davis? He has been through twice.

General DAVIS. There are none.

Senator MORGAN. And a fresh-water canal from Alexandria runs in there, does it not?

Mr. PARSONS. I would rather have you ask General Davis that, Senator.

General DAVIS. Yes, sir; there is a fresh-water canal leading from the Nile to Ismailia.

Senator MORGAN. What are the dimensions of that canal?

General DAVIS. It is about 10 feet deep and about 80 feet wide. It also extends to Suez, on the Red Sea side, and by aqueduct pipes to Port Said, on the Mediterranean.

Senator MORGAN. That canal is kept full of fresh water for the supply of the population?

General DAVIS. Yes, sir; and for irrigation.

Senator KITTREDGE. I want to call your attention to Mr. Stevens's testimony, found on page 278 of the record. In answer to a question by Senator Hopkins Mr. Stevens testified:

"Mr. STEVENS. To go through the locks? I should not suppose that it would take over fifteen or twenty minutes. I understand that at the Poe lock on the St. Marys Canal they put ships through in nine minutes."

What is the fact about that?

Mr. PARSONS. I think that Mr. Stevens there, in his hurry to read the reports through, had not properly taken into account the times required. In order to pass the Poe lock, Mr. Ripley states, in his paper on that subject, that after a vessel has actually stopped, and omitting the time lost in slowing down to come to a stop, it then takes her nine minutes, on the average, to go from that stop into the lock; then three minutes to close the gates; nine minutes to fill the lock or empty it; three minutes to open the gate, and, say, five minutes to move out of the lock, making a theoretical time of twenty-nine minutes from the time the vessel is stopped until it leaves the lock.

That, again, assumes that all those operations are to be made exactly, on time, without any interval of time between, and without making

any allowance for the time lost by the steamer in slowing up to come to the first stop, and of course assuming that there is nothing in her way. The probabilities are that in order to pass the Poe lock forty-five to fifty minutes will be taken, without any allowance for loss of time on account of other vessels being in the way. The board assumed that it would take an hour to pass even the tidal lock at Sosa under the worst conditions of the greatest adverse tide. I think Mr. Stevens in trying to read the report hurriedly has not weighed the time lost in passing through the locks, and possibly when he takes up this question to study it he might want to have a chance to revise his opinions.

Senator KITTREDGE. I also call your attention to Mr. Stevens's testimony found on pages 284 and 285, in which he states his preference for a lock canal; and, among other things, he says that the danger of navigation in a sea-level canal is greater than in a lock canal, and so forth. The portion I refer to is lengthy, and I shall not again put it in the record.

Mr. PARSONS. That, again, seems to be based upon Mr. Stevens's misconception of the Suez Canal; and, by the way, I should like to call attention to a typographical error, where the words "Soo Canal" appear instead of "Suez Canal."

Senator KITTREDGE. In whose testimony?

Mr. PARSONS. In Mr. Stevens's testimony.

Senator KITTREDGE. Where is that?

Mr. PARSONS. It is in the long paragraph, the fourth from the bottom, about one-third the way down, where he states: "That in the Soo Canal, which was the longest example of a canal in the world—something like 90 miles, I believe—no two ships are allowed to pass at speed." It obviously means Suez Canal.

Senator KITTREDGE. I understood that.

Mr. PARSONS. That comes back to the table I read a few moments ago, that Mr. Stevens has misconceived the dimensions of the Suez Canal. Of course, with a bottom width of 108 feet it is impossible for two boats to pass, and as the passing places are arranged one of them has to go into a passing place and stop there. With the additional widening that is now in progress with the Suez Canal it is expected to widen the canal to a width of 148 feet, approximately, all the way through—in other words, to connect the passing places—when ordinary vessels will pass each other without the necessity of tying up.

The CHAIRMAN. These large ships that are being built now could not pass in that width, could they?

Mr. PARSONS. Not at speed; no. With those very large ships now being built, or in the case of a battle ship, which steers badly, undoubtedly one vessel would have to stop; but in a case like that, where there is room enough to pass at all points, the meeting places, of course, could be very easily effected and arranged by telegraphic orders to the two ships in advance, and one vessel would stop anywhere and the other vessel would simply go by.

Senator HOPKINS. The great majority of ships that pass through the Suez Canal do not exceed 400 feet in length, do they?

Mr. PARSONS. No. That is, the ordinary ships of commerce are not these very large ships.

Senator HOPKINS. And the depth of the Suez Canal is not sufficient to permit vessels of the largest type to pass?

Mr. PARSONS. No; the very large vessels can not go through. They are deepening the canal now so as to permit it.

Senator MORGAN. The Suez Canal is 99 miles long, is it not—not 90 miles?

Mr. PARSONS. I was reading from Mr. Stevens's testimony.

Senator MORGAN. He was mistaken in the length of it by 9 miles, then. As I understand it, it is 99 miles long.

Senator HOPKINS. That Suez Canal passes through a perfectly level country, does it not?

Mr. PARSONS. It does.

Senator HOPKINS. Of a sandy soil?

Mr. PARSONS. Of a sandy soil. There are some rock and some hard material.

Senator MORGAN. There is a good deal of marl, is there not?

Mr. PARSONS. That is what I meant by hard material.

Senator HOPKINS. Has the Suez Canal any lock at all?

Mr. PARSONS. No, sir.

Senator HOPKINS. None whatever?

Mr. PARSONS. No.

Senator MORGAN. I thought it had a tide lock on the Mediterranean, but Mr. Parsons says it has not.

I would like to draw Mr. Parsons's attention to another matter. Taking the floor of the canal to be 40 feet below mean sea level all the way across the Isthmus, you would encounter rock at Gamboa, and you would continue to encounter it until you got to Pedro Miguel, digging the canal at that depth below sea level?

Mr. PARSONS. Yes, sir.

Senator MORGAN. About what would be the average height, if you can come at the computation in any way, of that mass of rock above sea level through that extent? Would it be 10 feet thick, or 5 feet, or 20 feet, or what?

Mr. PARSONS. Between Gamboa and Pedro Miguel?

Senator MORGAN. Yes.

Mr. PARSONS. I think I can get it from the profile here, sir. [Referring to map.] The rock or rocky material, I suppose, would average between those points 100 or 125 feet.

Senator MORGAN. In depth?

Mr. PARSONS. Yes, sir.

Senator MORGAN. So that that much of rock material would have to be removed before you would get to the floor of the canal?

Mr. PARSONS. Yes, sir; possibly to the floor of the canal it might even be somewhat more than that. In the greater part of that distance, through the Culebra cut, the surface of the ground now is, in round numbers, from 140 to 150 feet above mean sea level, and that would be 180 feet above the bottom of the canal. That is nearly all in either rock or rocky material.

Senator MORGAN. About what would be the length in miles of this cut through this rock?

Mr. PARSONS. Between Obispo and Pedro Miguel is 8 miles, in round numbers.

Senator MORGAN. So that there would be 8 miles of rock to be removed, one hundred and how many feet thick, did you say?

Mr. PARSONS. On an average, say, 125 feet.

Senator MORGAN. Well, that is in the main tough, hard rock—basalt, is it not?

Mr. PARSONS. It is basalt or a very, very hard clay that amounts almost to a rock. It is very variable in quality, but it is either rock or rocky material. It all requires blasting.

Senator MORGAN. I wish to ask you whether the joint board of engineers, in their study of this sea-level route, took into consideration its liability to convulsions from volcanoes or earthquakes?

Mr. PARSONS. We did.

Senator MORGAN. You took it into consideration?

Mr. PARSONS. We did.

Senator MORGAN. Did you notice the report that was made by Admiral Walker and his Commission, called the "Nicaragua Canal Commission," in 1899, in which they say:

"For Panama the records show 28 earthquakes. Of these, 12 occurred in the three years 1882, 1883, and 1884, which illustrates the incompleteness of the record as a whole. The only one that could be called destructive was that of 1621, which destroyed nearly all the houses in Panama. The next most severe was that of September 7, 1882. During this earthquake a part of the front of the cathedral in Panama was thrown down and the headquarters building of the canal company was cracked; the railroad had its track and roadbed in places thrown out of line, and the masonry of three or four bridges and culverts was damaged; at Las Cruces the church was thrown down; at Colon some lives were lost and crevasses were opened, and the Jamaica telegraph cable was broken."

That is a statement of that Commission.

The report was made in the daily Star and Herald of September 8, 1882, as follows:

[Star and Herald, September 14, 1882.]

SEVERE EARTHQUAKE ON THE ISTHMUS—MUCH DAMAGE DONE.

During the past week the Isthmus has been visited by several earthquakes which have done damage, but which fortunately have only caused two deaths. The following, copied from the daily Star and Herald, describes the events as they occurred from day to day:

[Daily Star and Herald, September 8.]

On Thursday, 7th instant, at 3.20 in the morning, the inhabitants of Panama were aroused from their beds by one of the longest and most severe earthquake shocks which has ever been experienced in this city. It was preceded by a hollow, rumbling noise which aroused and alarmed many persons. The motion was wave-like, and proceeded almost directly from north to south. The first and most severe shock must have lasted at least thirty seconds. Commencing with a moderate movement. It deepened in intensity, and toward the finish was so violent in strength that had it lasted ten seconds longer it is probable that at this moment there would not be a house standing in Panama. The shock had hardly terminated when the streets were filled with people, many of whom sought the outskirts of the town in order to avoid danger from the fall of edifices. A second and milder shock occurred about half an hour after the first one.

It is almost impossible to depict the alarm and excitement which followed. Panama has always been considered exempt from the mighty natural convulsions which are experienced almost periodically in the countries through which the giant Cordillera stretches its mountainous and volcanic ridges. That the shocks this morning were of exceptional violence appears to indicate a terrible calamity in some of those districts—and in all probability in the north—rather than a possibility that the old-time freedom of the Isthmus from earthquakes is

about to disappear, and that henceforth we are to be subject to such dangerous and fearful visitations as those which on that morning threatened the city with ruin.

The amount of damage done can not as yet be estimated, but it must amount to at least \$250,000. The municipal building and assembly rooms, under which the Cascada is situated, were much damaged. The whole of the massive balcony fell bodily into the square, dragging with it the roof and all adjacent timber.

The cathedral also suffered severely. Almost the whole of the ornate pediment, composed of heavy blocks of masonry, fell through the roof or onto the steps leading to the principal entrance. Every arch in the nave is cracked and split, and large stones and pieces of cement have fallen from them. The side aisles are also seriously damaged, and an expenditure of at least \$50,000 will be required to restore the building. The roof of the assembly room will be repaired at an early date, Governor Borbua having acted with remarkable celerity and commenced work at once in order that the archives and furniture may not be exposed to damage from the rain.

Private houses damaged are innumerable, and owners as yet fail to form a correct idea of the losses they have incurred. The walls of the canal office are cracked in several places, and the edifice requires strengthening. No estimate of damage can be made, but an expenditure of several thousand dollars must be incurred to render the building as safe as it was before the shock.

The ruins of buildings destroyed by fire are unfortunately too conspicuous in the center of the city. Their danger has frequently been pointed out, and the earthquake has now accentuated the peril consequent on their being allowed to remain as heretofore. Masses of these ruins have fallen down, and gaping cracks prove the necessity that they should be torn down. Outside the city a number of houses have suffered. The tower of Malambo Church has fallen, and a piece several yards square of the roof of Santa Ana Church has tumbled in. The crash among glassware and bottles has been universal, Mr. Brakemeler alone being a loser to the extent of \$2,000 from this cause. General Alzupuru's house, in the Calle Real, has suffered severely, as has also that of Don Manuel Hurtado, in front of the Government house. Others who have suffered damage are Señores Antonio Jimenez, Agustin Clement, José Manuel Casis, Barsallo, and the Grand Hotel, but the full extent of the damage done will not be known until the investigating committee has concluded its labors.

Several hours have now elapsed and there has been no repetition of the shocks. It may therefore be confidently anticipated that they will not be repeated.

The Pacific Mail steamship *Clyde* arrived from San Francisco on the night of the 6th. The earthquake was severely felt on board. Passengers declared that it appeared as if the vessel were lifted bodily from the sea and allowed to fall back.

Thanks to the kindness of Mr. J. B. Stearns, general manager of the Central and South American Cable Company, we are able to inform our readers that the offices at Buenaventura, in Cauca, and San Juan del Sur, in Nicaragua, announce that no shock has been felt in either of those ports. The cable is working excellently and gives no sign that a general volcanic disturbance has taken place.

The effects of the earthquake along the railroad have been most marked. The stone abutments of several of the bridges have been cracked and split and the earthwork has sunk in a half a dozen places. Gangs of men were put at work on Thursday so that traffic might be resumed as usual at the earliest possible day. Mr. Woods and his subordinates have been active and energetic as usual, and cars were busily employed loading ballast to fill the sunken places, while lumber was being cut and prepared to support the short bridges which have been weakened, as already mentioned, through the cracking of the abutments.

All along the railroad track the earthquake was severely felt. At Emperador, Gatun, Matachin, and all the canal stations much alarm was created.

In several places where the direct action of the shock appears to have made itself most strongly felt the rails were curved as if they had been intentionally bent.

Mr. Woods, general superintendent of the railway, went across the same morning and returned as far as Ballamona in the afternoon. Neither train crossed in the afternoon. The Panama train stopped on this side of Balla-

mona bridge and the passengers and their baggage were transferred to hand and push cars, and thus conveyed 8 miles over the road to Bohío Soldado—the farthest point the train from Colon could reach.

The earthquake created great alarm in Colon. The freight house was damaged, and it was rumored that one or two were killed, but no certain information on this point has been obtainable. It is known, however, that two gentlemen broke their legs through jumping from the upper stories of houses.

The telegraph wire was down during the early part of the day, but communication was reestablished at about 4 p. m.

The sea was remarkably calm at Colon at the time of the severe shock, thus tending to prove that the earth motion has not extended, as at first supposed, to the West Indies.

The passengers and mails per Royal Mail steamer *Don* could not come across yesterday, so that the *Lima*, after being delayed a day, had to leave for the south without them.

[Daily Star and Herald, September 8.]

Mother Earth on the Isthmus has not as yet returned to her ordinary quiescent condition. The severe shock of the morning of the 7th has been followed by several of less intensity, but which do not appear to make their effects felt over such a wide area. On Thursday afternoon several vibrations were experienced in different localities which were not felt in Panama.

At 11.30 p. m. on the 7th a sharp shock alarmed the whole city and drove the people from their houses to the squares. Hundreds of ladies, accustomed to every convenience and comfort, preferred to pass the night on mattresses, couches, and chairs in the public plazas to running the risk of being crushed to death in the houses. The inconveniences of the situation they thus accepted were obvious to the less timid, who walked from one square to another to see these temporary and uncampaign-like encampments.

A slighter shock occurred at about 3 in the morning, but fortunately neither it nor its predecessor added further ruin to that already incurred in the city.

All the shocks have been felt on the islands in the bay and some houses have suffered at Taboga.

La Chorrera has been very unfortunate. The church and the cemetery are a mass of ruins, and a number of houses have fallen. A bakery took fire and it and the adjoining house were totally destroyed by fire.

Between Gavilan and Punta Mala, in the vicinity of this city, a crevasse has opened which is 10 meters in width.

Some of the ruinous walls are being taken down, but there are several yet standing which are a permanent menace to adjoining properties and the lives of their inhabitants.

[Colon correspondence Daily Star and Herald, September 9.]

On the morning of September 7, at about 3.15, the residents of Colon were aroused from their peaceful slumber by the earthquake shock which has caused so much alarm and so considerable damage to the whole Isthmus. The duration of the shock was fully sixty seconds and was so severe that the whole populace rushed from their domiciles into the streets as rapidly as their feet could carry them.

The greatest alarm prevailed. About half an hour afterwards another shock was felt, but much lighter than the first. The sensation produced by the first and more violent shock was that the whole town was about to sink into the bowels of the earth. No very considerable damage was done. Several buildings were more or less damaged, including the French consulate, the house of Mr. F. R. Cowan, the Panama Railroad freight houses, and the wharves, the International Hotel, some smaller tenements in the rear of the town in the alley known as Cash street. One of the latter, built of brick and wood in the style known as brick noggin, was wrecked completely, and one unfortunate occupant, a native, was killed. Two others, one a Frenchman and the other a bookkeeper for Messrs. Isaacs & Asch, had each a leg broken in their haste to escape. The former will have to submit to the painful operation of amputation.

A deep fissure was opened in the earth from the south end of the freight house for a distance of about 400 feet along the walk leading in the direction of the

ice houses. Many buildings were moved slightly from their foundations, but on the whole remarkably little damage was done. On board the vessels in the harbor the shock was also felt very severely.

The losses sustained were principally in the breakage of bottles in the various stores and shops, and the smashing of crockery, mirrors, etc., in private residences. This is pronounced the most severe shaking up ever before experienced in the history of the country since the discovery and conquest, but on the whole the town has escaped without serious injury. On the 7th instant, about 1 p. m., another much slighter shock was felt, and during the night of the same day two more slight disturbances were reported. The people of the town have become quite alarmed and quite demoralized by these events, many rushing to the churches and calling upon God for protection and deliverance. If the result proves beneficial to the moral tone of the city, the tonic, although severe, may not be regretted.

It may be of meteorological interest to observe that the sea at the time remained here calm, the atmosphere quite clear, and the stars and waning moon remarkably brilliant. Soon after, say about 4 o'clock, a slight fog wafted from inland. No rain fell. All day an ominous calm prevailed, without rain, with fluctuating barometer and excessive heat, which led many to fear a return of the shocks during the night of the 7th, and few slept. But with the slight exceptions noted all remained quiet.

Another correspondent writes from Colon:

"At about 10 minutes past 3 this morning we experienced the most horrible earthquake that I ever felt in my life. The damage done I can not estimate. A German employed as bookkeeper by Messrs. Isaacs & Asch threw himself out of the window and broke his leg, and a colored man followed his example, with a similar result. Two men have been killed, one of them being buried under a falling roof. The whole of the made ground between the wharves and the lagoon is split in a number of places.

"A number of houses have suffered severely. Some have fallen down bodily. Number four mole and the freight house has been damaged. All here think the motion lasted at least one minute, and that it moved from the southeast toward the northwest."

[Daily Star and Herald, September 11.]

A slight earthquake shock occurred on the morning of the 9th a little before 5 o'clock. Much alarm was naturally created, but fortunately no damage was done. The frequent repetition of these movements causes a painful and uneasy feeling among the populace. A number of families passed the night on board the vessels in the bay and many in the public squares, and on Saturday a great many occupied the light cane houses on the outskirts of the city and at the Savana.

The same shock was lightly felt in Colon and along the railroad track. No damage was done, and work was continued on the houses injured by the shock of the 7th instant.

All day on Saturday no shock was felt, and the night passed quietly. At midday on Saturday there was a marked change in the atmosphere, and, with a refreshing shower which fell, the murky, sultry air of the previous days entirely disappeared.

The rumor of a volcanic eruption at the town and fort of Chagres is pronounced entirely false. Thoroughly reliable persons were there at 1 p. m. on Saturday and reached Colon the same evening. They report the earthquake to have been felt there, and that the earth had cracked slightly in two or three places. Beyond this no damage was done.

The shocks have been lightly felt on board the vessels in the bay, but they have experienced absolutely none of the tidal-wave effects which so frequently accompany widespread and powerful convulsions.

Passenger and freight trains will run over the road to-day as usual, as it is believed all the breaks will have been thoroughly repaired last evening.

The earthquake destroyed the little church at Cruces and damaged a few houses.

The rumors of a volcanic eruption at Chagres are entirely ~~without~~ foundation. The earthquake was felt there, did some little damage, and opened a few cracks in the ground.

A cablegram received from Mr. Scrymser, the president of the Central American Cable Company, announces that in New York it was known the Colon cable was broken and that nothing had occurred in Cuba and the other islands.

[Daily Star and Herald, September 12.]

A commission of canal employees left Panama on Sunday afternoon and proceeded to Chagres to inspect the ground where the volcanic eruption is said to have taken place. A photographer accompanies them in order to obtain exact representations of any physical changes which may have occurred. The principal members of it are MM. Canel, Alvo, and Canell. It is believed they will be absent about a fortnight, as they have to examine a wide field.

The rumors of the volcanic eruptions near Chagres and Cruces are declared to be entirely false by people arrived from there. One or two persons declare, however, that at 20 miles from Chagres, in the direction of "the coast," a small mud volcano has been observed, but these statements are as untrustworthy and false as many which have been set current within the past few days.

The truth of the matter appears to be that the repeated shocks have settled the loose alluvial soil, and that subsidence has occurred in several places, leaving fissures in some and in others ejecting the thin mud formed on the lower strata by the percolation of water. All the fissures observed so far present the same characteristics and appear to be formed in the manner described and not by volcanic rents originating in the bowels of the earth.

The bridges on the railroad are now fully restored and freight and passenger trains crossed as usual yesterday.

More rain is falling at Colon and on the other side of the Isthmus than on the Panama side.

Three old and valueless ranches fell at Gatun when the severe shock of the 7th took place. A beam from one of them struck and instantly killed a poor woman, who was asleep.

A number of people have walked, ridden, and canoed through the center of the Isthmus in order to discover the supposed volcanic center. Their labor has been valueless, and all have returned convinced that no excessively severe motion has been experienced in any part. No loss of life has occurred save the three cases we have reported.

[Daily Star and Herald, September 13.]

The earthquake of the 7th instant was felt at the Pearl Islands in the bay. At San Miguel one of the walls of the church fell in, and the inhabitants took the saints out and carried them in procession in the hope of preventing the repetition of the convulsion. They were panic-stricken. A correspondent writes that the earth continued moving for five minutes, but this must be incorrect.

At Donoso, Govea, and Rio Indio a number of shocks have been felt, and the people have been much frightened. At Miguel la Borda, 35 miles from Colon, in the direction of Bocas del Toro, the tide rose to an unusual height and flooded some of the houses, which are built on the beach almost on a level with the sea. The earth is said to have sunk in about a dozen places, and that cattle have been lost from this cause. The governor of the district writes officially that several boiling springs have suddenly appeared, some of which throw hot water to a considerable height. Although official, this report lacks confirmation.

Many people believe they felt shocks in Panama during the night of the 11th instant, but the majority declare no movement took place. Overexcitement in many cases conduces the belief that the earth is trembling, and the least sound, such as a heavy cart passing through the streets, is at once converted by the excitable into the commencement of a catastrophe.

A number of houses in Colon have suffered. A list is being drawn up. The heavy stone offices of the canal company have been badly cracked, and the employees are removing the desks, etc., to another building. The International Hotel, one of the largest buildings in Colon, has been somewhat damaged, but the trivial nature of the injury in such an extensive edifice seems to prove that

good brickwork can resist movements which seriously injure houses which have been cheaply constructed. The moles in front of the freight house and the made ground at the back of it show signs of the movement, but the heavy stone walls of the building, although cracked in some places, are sound and good, while the iron trestlework which sustains the roof and holds the walls together is as tight and plumb as the day it was put together. Many frame houses have sagged over in different directions. The majority of these houses were never remarkable for symmetry; now they zigzag one way and the other and give the town a most peculiar appearance. It must be remembered there are a number of frame buildings in Colon which were run up as the earth was dumped into the sea to form the spit on which the town stands, and that consequently it is not surprising if the slightest shake should affect these frail wooden structures which have been exposed during nearly thirty years to the vicissitudes of the variable tropical climate.

The bronze statue of Christopher Columbus was shaken free from the stone pedestal on which it stands, and moved about 4 inches from its former location. It can be readjusted at slight cost.

At 6 a. m. yesterday the rain was pouring down in torrents in Colon.

The Harrison steamer *Mediator* has arrived at Colon, and reports that a slight shock of earthquake was felt in Cartagena on the morning of the 7th. No damage was done. Letters from there dated the 9th scarcely mention the occurrence, thus proving the little importance attached to it.

Letters have been received from the towns of La Villa, Chitre, Macaracas, and Nata, all in this State, announcing that several shocks have been felt, but that the material of which the houses are built—bamboos and adobes—resisted the movements and have suffered no damage. At La Villa the bells in the church rang several times. The people do not appear to have been so alarmed as they have been in other parts of the Isthmus.

[Daily Star and Herald, September 14.]

Messrs. Schuber Brothers' steamer *Cargador*, from ports in the northern Departments of the State of Panama, arrived yesterday, reports that repeated earthquakes have been felt, but that no damage to life or property has followed.

The canal Commissioners sent to examine reported volcanic effects in the center of the Isthmus have telegraphed that they are unable to find traces proving that the shocks have been sharper there than anywhere else in the State.

Two or three slight tremblings were experienced in this city during the night of the 12th, but they caused no alarm. Many people are returning to their houses.

I wanted to call your attention to that situation and to ask you whether the taking out of 165 feet of rock for a distance of 10 miles through the Culebra Heights, if it had occurred before that earthquake took place, would not, in your judgment, have produced very serious consequences?

Mr. PARSONS. I think not, Senator.

Senator MORGAN. You say not?

Mr. PARSONS. I think not.

Senator MORGAN. Is it your opinion that the deeper you go into the earth across that Isthmus the greater the security is against earthquakes?

Mr. PARSONS. No, sir.

Senator MORGAN. Do you not think that that uplift of land called "Culebra Ridge," underlain by this strata of basaltic rock, is stronger to resist earthquake motion than it will be when you have dug it out to 40 feet below sea level?

Mr. PARSONS. I do not believe that the depth of that excavation would have any effect, one way or the other.

Senator MORGAN. You think not?

Mr. PARSONS. I think not, sir.

Senator MORGAN. Within a reasonable period, as late as the 31st of January, 1906, an earthquake has occurred on the coast below Panama, not distant more than 200 or 250 miles, I think, which entered a bay on the Pacific side of Ecuador and passed through to Cartagena, which is on the Madeira River, in the State of Colombia, and that earthquake broke the cables in four places, and, as the papers state, tore down villages situated on this bay that I speak of; and its effects were also transmitted through to Cartagena to such an extent that a cable in that vicinity—I do not know exactly where it is located—was also broken. That indicates that there is a repetition of this volcano or earthquake action still going on.

Mr. PARSONS. Oh, yes; we have earthquakes all over the world. We have them here and in New York—everywhere.

Senator MORGAN. Do you think that a lock canal across the Isthmus of Panama would be no safer than a sea-level canal under those conditions?

Mr. PARSONS. I do not think it would be as safe.

Senator MORGAN. Will you state a reason for that?

Mr. PARSONS. I think that the danger to be feared from earthquakes is in connection with the locks—in throwing the gates out of adjustment, so that you could not work them.

Senator MORGAN. That would be an additional danger?

Mr. PARSONS. I think so. I consider that the greatest danger from earthquakes would be felt at the locks. I should not be so much afraid of an earthquake in an open excavation. You might have, undoubtedly would have, rock thrown off from the side; and if the rock came down upon and struck a passing ship you would have an accident.

Senator MORGAN. All of the witnesses here have described bits of what they call slipping or creeping clay that are found in this great elevation at the greatest depth of the Culebra cut that, in times of great rainfall, come out of their location and fall upon the benches, and so forth, and some of them have fallen down upon the diggings and covered up, as they state, tracks and cars and the like of that. Now, if you take out the stone to a depth of 40 feet below sea level through the Culebra cut, would it or would it not greatly increase the danger of the filling up of the canal by these landslides?

Mr. PARSONS. The clay is found at the extreme summit of Culebra cut, and the great bulk of that clay will be removed in the ordinary construction of the canal. Mr. Stevens himself, in his testimony, has gone into that with very great thoroughness. I noticed that when I read over his testimony. And I think he showed that the biggest slide that they have had there includes only some 200,000 or 225,000 cubic yards, if I remember the figures correctly; so that even that big slide is of no great amount, and that, he explained, is being caused by the water getting into the top and sliding that clay off.

Senator MORGAN. The main point that I want to get at is this: Whether or not this consulting board regarded the fact that such an earthquake as I have read about here occurred in 1882, and that there were a number of instances before mentioned in the report of Admiral Walker; whether that board disregarded or ignored the possible effect of the recurrence of these earthquake movements in

considering both types of the canal; whether they disregarded it as an element not worthy of consideration?

Mr. PARSONS. Oh, no; the possibility of earthquakes was taken into account. It was one of the reasons of the majority, and it was one of my own reasons for preferring the sea-level canal. I consider that there is very much less danger of damage to a sea-level canal by earthquakes than there would be with a lock canal. The locks are necessarily more or less delicate structures. The gates have to close exactly; they are very heavy, weighing hundreds of tons, and there is also the machinery to operate them. With a very violent earthquake if the foundations of that lock were disturbed the gates would not operate and you would have to take the gates down and reconstruct them. It might even be that the gates would be so thrown out as to leak and drain off the water from that upper level.

Senator MORGAN. So that you consider a sea-level canal safer against earthquake movements than a lock canal through that portion?

Mr. PARSONS. Very much more so.

Senator MORGAN. But that a lock canal can be constructed with locks at Gamboa, which is practically outside of this rock belt, and locks at Pedro Miguel and Miraflores, which is practically outside also, in the other direction?

Mr. PARSONS. Yes.

Senator MORGAN. So that locks constructed at those places would not be, as you think, so amenable to earthquake disturbance?

Mr. PARSONS. Oh, no; I think you run the risk of earthquake disturbance all the way across. I would rather have no locks at all; but, as we were discussing yesterday, if you are going to put in a canal that can be transformed into a sea-level canal, the best way is to put in locks on the north and south flanks of the divide, and then remove them subsequently, after the beginning of the operation of the canal.

Senator KITTREDGE. What would be the distance between a lock at Obispo and at Pedro Miguel?

Mr. PARSONS. About 8 miles.

The CHAIRMAN. If no other Senators desire to ask any questions we will excuse you, Mr. Parsons, and we are very much obliged to you. The committee will have no meeting this afternoon, but will adjourn until half past 10 to-morrow.

(The committee thereupon adjourned until to-morrow, March 15, 1906, at 10.30 o'clock a. m.)



ISTHMIAN CANAL.

COMMITTEE ON INTEROCEANIC CANALS,
UNITED STATES SENATE,
Washington, D. C., Thursday, March 15, 1906.

The committee met at 10.30 o'clock a. m.

Present: Senators Millard (chairman), Kittredge, Dryden, Hopkins, Knox, Ankeny, Morgan, Taliaferro, and Simmons.

Present also, Maj. Gen. George W. Davis, U. S. Army (retired).

STATEMENT OF ALFRED NOBLE, ESQ.

The CHAIRMAN. Mr. Noble, kindly state your name and address to the stenographer.

Mr. NOBLE. Alfred Noble; No. 1 West Thirty-fourth street, New York.

Senator KITTREDGE. What is your age, Mr. Noble?

Mr. NOBLE. Sixty-one.

Senator KITTREDGE. And what is your professional record and experience?

Mr. NOBLE. I was graduated from the engineering department of Michigan University in 1870. For about two years preceding I had been, the larger part of the time, on harbor works in Lake Michigan, and shortly after graduation I went to the St. Marys Falls Canal, where I remained in local charge for twelve years. I was then engaged in bridge work at various localities. Do you wish the details of that, Senator?

Senator KITTREDGE. Oh, no; just in a general way, to indicate the experience that you have had as an engineer; that is all.

Mr. NOBLE. I was engaged on bridge work as resident engineer and assistant chief engineer until 1894, and since that time I have been in general practice, or, rather, I was in general practice for several years, during which time I was a member of the Nicaragua Canal Board and of the Board of Engineers on Deep Waterways.

Senator KITTREDGE. With what great engineering work are you now connected?

Mr. NOBLE. I am now chief engineer of a portion of the Pennsylvania Railroad terminal proposition in New York.

Senator KITTREDGE. You were connected with what is called the Ludlow Commission?

Mr. NOBLE. Yes, sir.

Senator KITTREDGE. When was that created, and how long did you serve as a member of it?

Mr. NOBLE. That was created in the spring of 1895, and we finished our work, I think, October 31 of the same year.

Senator KITTREDGE. You were also a member of what is known as the Walker Commission, or the Isthmian Canal Commission appointed in 1899, were you not?

Mr. NOBLE. Yes, sir; I was a member of the first Isthmian Canal Commission.

Senator KITTREDGE. And continued in that service for what length of time?

Mr. NOBLE. Our work was practically finished in 1901. We were disbanded about two years later, I think.

Senator KITTREDGE. During the past year you were a member of the Board of Consulting Engineers of the Panama Canal?

Mr. NOBLE. Yes, sir.

Senator KITTREDGE. You served in that capacity?

Mr. NOBLE. I served in that capacity; yes, sir.

Senator KITTREDGE. Signing the minority report?

Mr. NOBLE. Yes, sir.

Senator KITTREDGE. Which we have before us. Of course you are familiar with the majority report of that Board?

Mr. NOBLE. I am.

Senator KITTREDGE. Have you any criticism to make of the views of the majority further than you have expressed in the minority report which you signed?

Mr. NOBLE. I do not think that I have, Senator.

Senator HOPKINS. Mr. Noble, if there is any reason why we can not have a sea-level canal there, I would like you to go on and show why, in your judgment, that is not a good canal to construct.

Mr. NOBLE. I think, Senator, that the comparison of any two projects which capable engineers would devise for the isthmian canal must be a comparison of relative advantages and disadvantages. Each type of canal has its features of superiority and its features of inferiority.

Senator HOPKINS. What are the features of inferiority in the sea-level canal now?

Mr. NOBLE. The principal one is the contracted waterway as compared with a lock canal, and its greater cost.

Senator HOPKINS. What disadvantages are there in a contracted waterway?

Mr. NOBLE. Slower speed of vessels and greater risk to vessels traversing the waterway.

Senator HOPKINS. Have you read the testimony of Mr. Parsons, the engineer who was last here before us?

Mr. NOBLE. No, sir; I did not receive it in time to do so.

Senator HOPKINS. Mr. Parsons, if I remember his evidence correctly, demonstrated that the sea-level canal permitted a quicker passage than the canal proposed by the minority by some three hours, if I remember.

Senator KITTREDGE. At least two hours.

Senator HOPKINS. Yes; at least two hours. What have you to say to that?

Mr. NOBLE. I think that the time required to pass through the Isthmian Canal must be taken in connection with the volume of the traffic. I have no doubt whatever that a small vessel, meeting no others, could pass through the sea-level canal in less time than through the lock canal. I do not think that a vessel of the largest

size that is now contemplated could do so, and when the traffic gets very dense I do not think that any of them could do so.

Senator HOPKINS. Well, why? Why do you make that statement? Make it clear by a detailed statement.

Mr. NOBLE. I think it is pretty generally agreed by all members of the Board, practically, that if two vessels of moderate size, or larger, were to meet in the sea-level canal, one of them would have to tie up while the other passed. That is the practice at Suez, and it is expected to be the case there, even after they get their widening completed. That is the case at Manchester; it is the case at Kiel.

At those meeting places it is necessary to have a force of men to take lines and to assist in making the vessels fast, to have mooring piles driven, and a regular place for it, so that the amount of delay that would occur in consequence of those meetings would depend upon the number and distance between those meeting places. In the report of the minority is given the result of a calculation, made as carefully as we could make it, of the length of time required by two different types of ships, with two different arrangements of meeting places. A comparison of those will show what effect the distance between mooring places has.

At Suez the distance between the mooring places appears to be about 4 miles. These calculations in the minority report are based one on an interval of about 5 miles and the other on intervals of $2\frac{1}{2}$. Those delays would be cumulative in case of a heavy traffic and would very soon, as traffic increased, make it require a longer time for ships to pass the sea-level canal than to pass the lock canal.

I do not see any escape from that conclusion.

Senator HOPKINS. Then you think that, while theoretically the friends of a sea-level canal can figure out two hours of time saved over the lock canal, that as a practical matter the result will be just the reverse?

Mr. NOBLE. When the traffic becomes somewhat dense.

Senator TALIAFERRO. Mr. Noble, is it a fact or not that the capacity of the lock canal is measured by the capacity of the narrowest point in the lock canal, or the locks themselves?

Mr. NOBLE. I think that is true, without a doubt. The waterway in the lock canal is so broad that there will be no difficulty in vessels passing anywhere, excepting possibly in a distance of less than 5 miles through the narrowest portion of the Culebra cut.

Senator TALIAFERRO. But if you were measuring the greatest capacity of the lock canal, would that maximum capacity be limited by the capacity of the locks in your lock canal?

Mr. NOBLE. I think so, Senator.

Senator HOPKINS. Before we get through with the sea-level canal I want to ask you if any fair comparison can be made between the Suez Canal and the proposed sea-level canal at the point proposed by the American Government here at Panama?

Mr. NOBLE. I think the conditions of navigation through the two canals will be very much the same, except as modified by the tide-lock at the Pacific end of the sea-level Panama Canal.

Senator HOPKINS. One of the engineers who has testified on this subject raised the point of objection against a sea-level canal that owing to the topography of the country here and the Chagres and

other rivers it would require constant dredging to keep the sea-level canal clear. What is your judgment about that?

Mr. NOBLE. I think that is true. I think it will require dredging to keep the sea-level canal clear, and it does to keep the Suez Canal clear. I think the parallel still holds.

Senator HOPKINS. It does?

Mr. NOBLE. Yes, sir.

Senator HOPKINS. In the case of the Suez Canal there are no streams running into that canal, are there?

Mr. NOBLE. No, sir.

Senator HOPKINS. The dredging that is required there comes from the sea, does it, from either end of the canal, or how does it come?

Mr. NOBLE. I have never been at the Suez Canal, so that any statement that I may make is based upon the best information I can get, from reading and from hearing, from those who know of it. A great deal of sand is swept into the Suez Canal from the dry desert, and a large part of the maintenance, as I understand it, is caused by that. So far as I know, the entire amount of maintenance, as they classify it, at the Suez Canal is caused by that.

May I add a sentence to that?

Senator HOPKINS. Certainly.

Mr. NOBLE. This relates to the canal itself as a channel. At the Mediterranean end, at Port Said, there is a large amount of maintenance required to keep the entrance channel open. I am unable to say how the cost of maintenance should be divided between those two works—one to keep the canal open, the other to keep the entrance open.

Senator HOPKINS. The canal at Panama is to be cut through a very uneven country, is it not?

Mr. NOBLE. Yes, sir.

Senator HOPKINS. And the water that comes from the Chagres and other rivers must be cared for?

Mr. NOBLE. Yes, sir.

Senator HOPKINS. What is your judgment as to the effect the waters from those rivers will have upon the sea-level canal at this point?

Mr. NOBLE. I think that the silt brought down the Chagres River as far as Gamboa is adequately provided for in the project for the sea-level canal. Between Gamboa and Bohio there is an area, estimated at 250 square miles, which would drain naturally directly into the canal. A portion of that, which is, as nearly as I can measure it on the map, about 75 square miles—it may be more or less—is to be diverted by the sea-level project and passed through the dividing ridge to the eastward without entering the canal. The drainage of the remaining area, 150 square miles or more, will still flow into the canal and from a rather rapid watershed. By making catch-basins at the mouths of those streams they can catch and retain the coarser part of the material brought down, without doubt. Still, I think a good deal of the finer material would be swept into the sea-level canal and would require pretty steady attention in the way of dredging.

Senator KITTREDGE. Is there anything difficult in that operation?

Mr. NOBLE. Oh, it is nothing difficult. It is the ordinary operation of dredging, involving whatever expense is attached.

Senator HOPKINS. That would have to be constant, would it, in your judgment?

Mr. NOBLE. I think so, sir. I think it will be necessary to maintain a regular plant for that purpose.

Senator HOPKINS. For dredging purposes?

Mr. NOBLE. For dredging purposes; yes, sir.

Senator HOPKINS. And keep it constantly in operation?

Mr. NOBLE. Practically so.

Senator DRYDEN. A large and expensive plant?

Mr. NOBLE. It is pretty difficult to form an opinion as to that, Senator. The Isthmian Canal Commission, when attacking the same problem, made an estimate of the cost of maintenance and of operation, the cost of maintenance being based, as far as the maintenance of the channel is concerned, upon an assumed plant supposed to be adequate to do it, and the dredging plant in that project was to comprise two first-class dredges. In the estimates for maintenance and operation of the sea-level canal prepared for the minority report in this case we estimated that that plant would be doubled.

Senator KITTREDGE. Point out on the map the location of the rivers that are not provided for by the majority in the matter of carrying silt to the canal basin.

Mr. NOBLE. May I show instead what rivers are provided for?

Senator KITTREDGE. I would like to have you do both.

Mr. NOBLE. The entire area there that is tributary to the canal or to the Chagres between Gamboa and Gatun is given in all the estimates as 250 square miles. Now, approximately this area is provided for by a diversion of its water supply through the ridge to the outlets east of the Bohio ridge.

Senator KITTREDGE. You mean west of the Bohio ridge, do you not?

Mr. NOBLE. North of the Bohio ridge, I should say, perhaps, Senator.

Senator KITTREDGE. That is probably more accurate.

Mr. NOBLE. Yes. Now, this area measures about 73 square miles, as I drew the line on the map around these tributaries. There must be, of course, some uncertainty about that, because, as you can see, the topography is not sufficiently developed there to make that very certain.

Senator KITTREDGE. I understand that you think that has been taken care of sufficiently by the majority?

Mr. NOBLE. It looks so; yes, sir.

Senator HOPKINS. For the coarse matter; but has it for the fine?

Mr. NOBLE. All the water, as I understand it, will be retained by these dams. No water will pass down these streams below these dams, but it will find an outlet over the ridge to the northward. Consequently that is adequately provided for, I should say, as to fine material and coarse. It is conceivable—

Senator KITTREDGE. It stops all silting material altogether, does it?

Mr. NOBLE. It stops all silting material altogether. It is conceivable that some time in the future those basins may fill up somewhat, but that is pretty remote.

Senator KITTREDGE. And neither the silt nor the water goes into the canal basin?

Mr. NOBLE. No, sir.

Senator KITTREDGE. Is that right?

Mr. NOBLE. That is the way I understand it.

Senator MORGAN. Is it the project to throw those streams that empty into the Chagres River on the west back upon their sources and through their sources into the sea?

Mr. NOBLE. Yes, sir.

Senator MORGAN. To dam them up in the vicinity of the line of the canal, throw them back upon their sources, and through their sources over into the sea at some other point?

Mr. NOBLE. Yes.

Senator MORGAN. That is the project of protecting that canal?

Mr. NOBLE. Yes. That water, of course, will eventually flow down the Trinidad through this swamp and pass in the neighborhood of Gatun.

Senator MORGAN. Yes. That is the way in which that water is expected to be handled?

Mr. NOBLE. Yes, sir.

Senator MORGAN. And on the other side, up there above Gamboa, that water is expected to be controlled by a dam?

Mr. NOBLE. By a dam; yes, sir.

Senator MORGAN. And by underflow?

Mr. NOBLE. By an outlet weir or controlling works detached from the dam, through a rock site.

Senator MORGAN. Yes—through sluice gates?

Mr. NOBLE. Yes, sir.

Senator MORGAN. That comprises, really, the protection that is given to the sea-level plan against the waters of the Chagres River and its affluents?

Mr. NOBLE. Yes, sir.

Senator KITTREDGE. I wish you would go on now, Mr. Noble, and show what other rivers indicated on that map have been provided for by the majority, and what have not been.

Mr. NOBLE. I do not understand that any other streams have been provided for by the majority, other than those that I have pointed out.

Senator KITTREDGE. Point out the streams that will, in your judgment, affect the canal in the manner indicated.

Mr. NOBLE. I will point out all these coming in on this bank above this point, Senator, up as far as this [indicating].

Senator KITTREDGE. What are the streams there? Are you familiar with the geography?

Mr. NOBLE. I would have to read the names, and I am afraid I would sacrifice the pronunciation somewhat, Senator. I will simply take them off the map, if that will answer the purpose.

Senator KITTREDGE. Is that the only place?

Mr. NOBLE. Also all these on the south side, from Bohio up.

Senator KITTREDGE. Are not those taken care of by a divergence channel?

Mr. NOBLE. Only during construction. It is intended, after construction, to receive them directly into the canal.

Senator TALIAFERRO. Without passing them through dams?

Mr. NOBLE. By passing them through pools, in which, it is expected, the coarser material at least will be deposited.

Senator TALIAFERRO. As I understand you, then, all of the streams are provided for by that method? All that empty into the canal are

expected to pass through pools or dams, so as to take the coarser silt out before the water empties into the canal basin?

Mr. NOBLE. I think so.

Senator KITTREDGE. Do you regard that situation you have just described as a serious objection to the sea-level plan?

Mr. NOBLE. Only inasmuch as it makes a somewhat larger charge for maintenance; and, as I have already said, I do not consider that an impossible or an impracticable proposition at all.

Senator KITTREDGE. How large are these streams that enter into the canal basin that have not been provided for?

Mr. NOBLE. I could answer that question better perhaps by giving an estimate of the amount of water that might possibly be expected from them.

At Bohio it is estimated that the largest flood that has ever passed down the river may have been 136,000 or 140,000 cubic feet per second.

Senator KITTREDGE. Which river is that?

Mr. NOBLE. That is in all of the basin above Bohio.

Senator KITTREDGE. That includes the Chagres?

Mr. NOBLE. That includes the Chagres; certainly.

Senator KITTREDGE. It includes the water that comes from the territory that you say has been provided for by the majority?

Mr. NOBLE. Yes, sir.

Senator KITTREDGE. How much water passes down there naturally under present conditions?

Mr. NOBLE. About 136,000 cubic feet is the estimated maximum flood that has ever occurred. The experts differ somewhat.

Senator HOPKINS. Per second?

Mr. NOBLE. Per second. The experts differ somewhat as to that. I think the French Panama Canal Company—those estimates, I think, were prepared by General Abbot—considered that to be about 112,000, and Mr. Arthur Davis, of the Canal Commission service, estimated that it might be as much as 136,000. That variation in estimates is no more than might have been expected from the character of the data.

Senator KITTREDGE. How much of that is due to the Chagres and to the area that has been provided for by the majority?

Mr. NOBLE. If I can complete my answer, Senator—

Senator KITTREDGE. Certainly; I thought you had.

Mr. NOBLE. I was about to state that this flood of 136,000 second-feet was collected on an area of about 700 square miles. Of that area about 150 square miles—somewhere from 150 to 175 square miles—would still be tributary directly to the canal between Gamboa and Bohio after the construction of the sea-level canal, after excluding the areas which it is proposed to divert to the northward, and excluding the area above the site of the Gamboa dam.

The proportionate amount in regard to area only of a flood of 136,000 feet that would come from an area of 150 square miles would be about 29,000 cubic feet a second, and that, perhaps, is not far from the maximum amount that might be expected to come into the canal.

Senator MORGAN. Mr. Noble, I want to take a sort of a blackboard lesson from you, if you please, about this business. I do not know anything at all about it. That is Gamboa [indicating]?

Mr. NOBLE. That is Gamboa; yes, sir.

Senator MORGAN. There is a dam there?

Mr. NOBLE. Right here [indicating].

Senator MORGAN. This first body of water on this map—dead water—is made up of the waters that are impounded by a dam that crosses here somewhere?

Mr. NOBLE. Right there, sir [indicating].

Senator MORGAN. And that is the Gigante River?

Mr. NOBLE. The Cano Quebrado and the Quebranco.

Senator MORGAN. Where is the Gigante?

Mr. NOBLE. The Gigante is over there, sir [indicating].

Senator MORGAN. What is this here?

Mr. NOBLE. These are the three branches of the Gigante. This is called the Rio Gigantito and also the Gigante on the map.

Senator MORGAN. What is this?

Mr. NOBLE. This is the Quebranco.

Senator MORGAN. That is much the largest stream of any of them?

Mr. NOBLE. Yes, sir.

Senator MORGAN. The longest and with the most watershed?

Mr. NOBLE. Yes, sir.

Senator MORGAN. Now, what I want to ascertain is this: Is it practicable to make a drainage canal—I will call it—cut between Gamboa and the mouth of this river, or, at least, a dam on this river, and lead the waters that flow toward the Chagres above Gamboa out into the sea here or into the marshes?

Mr. NOBLE. I should think not. I should think that would be too formidable a proposition to undertake.

Senator MORGAN. It would cost too much?

Mr. NOBLE. I should think so.

Senator MORGAN. Are the physical difficulties very great?

Mr. NOBLE. Very great. It is a hilly country all the way through there, Senator.

Senator MORGAN. Yes. So that the sea-level canal would occupy the basin of the valley, the lower lands?

Mr. NOBLE. Yes, sir.

Senator MORGAN. And you think it would be too expensive to undertake to carry off the flood waters of the Chagres River by bringing them down to the mouth of this river or to the dam across this river and carrying them out this way to the sea?

Mr. NOBLE. I am giving you my impression only, Senator. I have not studied the matter.

Senator MORGAN. Certainly; that is what I am trying to get.

Mr. NOBLE. That is my impression.

Senator MORGAN. Now, on the other side here are the very high hills on the right bank of the Chagres, or what we might call the right bank of the sea-level canal between Bohio and Gamboa.

Mr. NOBLE. The country here is pretty hilly. I do not remember what the altitude of those hills is.

Senator MORGAN. Pretty hilly?

Mr. NOBLE. It is a pretty hilly country all along this valley.

Senator HOPKINS. Senator, let him state what valley it is, so that the report will show that.

Mr. NOBLE. Along the valley of the Chagres, between Gamboa and Bohio.

Senator MORGAN. What I am trying to get at, Mr. Noble, is whether, by hugging the hills, beginning at Bohio and running up to Gamboa, with the sea-level canal, you would not free that canal from almost all invasion by the waters that flow into the Chagres River on its left bank?

Mr. NOBLE. I am giving it as my impression only, for the reason that I have not studied it; but I should think that the construction of a canal of that sort would be rather difficult.

Senator MORGAN. Why?

Mr. NOBLE. I think it would be expensive; I think the course of it would be very crooked.

Senator MORGAN. If you cut off the hills on the side next to the river and threw the dump right into the river, forced it out so as to keep it away from the canal, would not the expense be reduced by the fact that you would free the canal from this water?

Mr. NOBLE. I could not say.

Senator MORGAN. You could not say? Have you ever studied that proposition?

Mr. NOBLE. No; I never have.

Senator MORGAN. You would not think it was impossible?

Mr. NOBLE. I would not say that it was impossible. I would not even say that it is impracticable; but I should expect it to be so.

Senator MORGAN. You would expect it to be so?

Mr. NOBLE. Yes, sir.

Senator MORGAN. But that proposition has never been studied by the Board or by either the majority or the minority?

Mr. NOBLE. No, sir.

Senator MORGAN. Nor this proposition of draining these waters off here?

Mr. NOBLE. Not to my knowledge. The majority may possibly have done so.

Senator MORGAN. Your studies have been confined to protecting the canal against these waters that flow into it on the left bank of the Chagres by dams, some of which impound the water and make no further disposition of it, and others of which impound the waters and throw them back from their sources into the sea?

Mr. NOBLE. I think that is the limit of the studies. I think that is the result, in a way, of the studies concerning the drainage on the west side of the route.

Senator MORGAN. If you were going to make a canal, for instance, on the plan of Bunau-Varilla, or any of these other persons who have suggested a lock canal, between Gamboa and, say, Miraflores or Pedro Miguel, where would you put the locks in the Chagres River?

Mr. NOBLE. Oh, I suppose that Obispo would be the natural location for one or more of the locks, and Pedro Miguel certainly for another, or very likely Miraflores, depending upon the number of locks built, and where the others would be in there I would not undertake to say without studying the maps.

Senator MORGAN. Then the difference between the lock that we are supposing might be put in there at Gamboa and that at Miraflores is about 10 miles, is it not?

Mr. NOBLE. Ten miles; yes, sir.

Senator MORGAN. If you were to dig a sea-level canal from the Bay of Limon up to, say, Obispo, or somewhere in that vicinity, until you

got to a good place to put in a lock, could the canal from there out be supplied by the water that would come from the Chagres River, impounded by the dam at Gamboa or in that vicinity?

Mr. NOBLE. Oh, I have no doubt it could be.

Senator MORGAN. You have no doubt of that?

Mr. NOBLE. No.

Senator MORGAN. Sufficient for all commercial purposes?

Mr. NOBLE. I think so; yes, sir.

Senator MORGAN. Between Gamboa and Miraflores?

Mr. NOBLE. I do; yes, sir.

Senator MORGAN. That is all I wanted to ask.

Senator KITTREDGE. Have you covered the area that is not controlled by dams?

Mr. NOBLE. I have stated that the maximum volume of water that might be expected to flow directly into the sea-level canal between Gamboa and Bohio might be estimated at 29,000 cubic feet per second.

Senator KITTREDGE. And from how many rivers or streams will that come?

Mr. NOBLE. I suppose it would come from a very large number of little streams—about all those that are shown on this map and, doubtless, a great many more in case of a storm making their way down those hillsides.

Senator KITTREDGE. You say, "a very large number?"

Mr. NOBLE. Yes.

Senator KITTREDGE. Can you give us any figures you have in mind?

Mr. NOBLE. No; I could do nothing better, Senator, than to read to you these principal ones from this map.

Senator KITTREDGE. Are there 50?

Mr. NOBLE. I should think there might be 50. There are not 50 shown, by any means. I think you would have water running into the canal at 50 points, without doubt.

Senator KITTREDGE. And wherever the water comes into the canal it first passes into a basin?

Mr. NOBLE. These smaller streams, that would simply be of a temporary nature, I presume would not.

Senator KITTREDGE. But the important streams?

Mr. NOBLE. The important streams, as I understand, according to the sea-level plan, would pass through settling basins.

Senator KITTREDGE. And then from the basins through a weir into the canal basin?

Mr. NOBLE. Into the canal.

Senator KITTREDGE. Is that right?

Mr. NOBLE. That is right, as I understand it.

Senator KITTREDGE. I think that is all I want to ask, Senator Hopkins, on that proposition.

Senator MORGAN. Mr. Noble, how long have you been acquainted with and connected with the subject of building a canal across the Isthmus of Panama?

Mr. NOBLE. My connection with it was as a member of the first Isthmian Canal Commission, my active connection being for about two years; and then again as a member of the present consulting board.

Senator MORGAN. Yes.

Mr. NOBLE. I had seen the Panama Canal before. I had given some little attention to it in 1895.

Senator MORGAN. You have studied the question in all of its phases of development up to date?

Mr. NOBLE. I have studied them; yes, sir.

Senator MORGAN. Closely and carefully?

Mr. NOBLE. I have never given very close attention to the old Lull project of 1874, or thereabouts.

Senator MORGAN. Were you in that?

Mr. NOBLE. Oh, no; no, sir. I have a copy of the report.

Senator MORGAN. That was the first report made by Menocal?

Mr. NOBLE. Yes, sir.

Senator MORGAN. That was an instrumental survey across there?

Mr. NOBLE. Yes, sir.

Senator MORGAN. I have his report, and I think I will call the attention of the committee to it after a while, as it will throw a great deal of light upon this question even now.

In your first study of the subject of a canal across the Isthmus, as a member of the Isthmian Canal Commission of which Admiral Walker was the president, did that Commission reach the conclusion that for any reason, and what reason it may have been, a sea-level canal across that Isthmus was impracticable?

Mr. NOBLE. I should want to see the language of the report before I would like to answer definitely a question of that kind. There is an expression in the report upon the subject of the feasibility of a sea-level canal. I can give a reference to it for the committee, if that would answer your question.

Senator MORGAN. We can get that at any time? That is in the report?

Mr. NOBLE. Yes; that is in the report.

Senator MORGAN. Whatever the language of the report is, that is the language to which you at that time subscribed?

Mr. NOBLE. Yes.

Senator MORGAN. But the Commission, as a commission, without any dissent, rejected the proposition of a sea-level canal at that time?

Mr. NOBLE. Yes, sir.

Senator MORGAN. The reasons being stated in the report of the Commission?

Mr. NOBLE. Briefly; yes, sir.

Senator MORGAN. Then you projected a canal with a dam at Bohio, which was the key of the situation?

Mr. NOBLE. Yes, sir.

Senator MORGAN. That plan was upon the proposition that if a dam at Bohio could not be established permanently and satisfactorily it was not practicable, within the knowledge or belief of that Commission, that a lock canal could be built there?

Mr. NOBLE. I do not think that that question, in that form, was before the Commission or was considered by them. Bohio was thought at that time to be a practicable site for a dam.

Senator MORGAN. Yes. The Commission studied it with all due care, of course. Now, since that time they seem, all of them, to have abandoned Bohio. Can you state the reason for that?

Mr. NOBLE. The situation at Bohio is not so favorable for a dam as was supposed at that time; and the minority believe that the con-

ditions at Gatun are more favorable than anybody at that time expected.

Senator MORGAN. Yes. Now, was it not the fact that Mr. Wallace, when he went there, conducted borings at Bohio upon the same general axis for a dam, and found that the former Commission had not reached what was supposed to be solid rock?

Mr. NOBLE. That is true.

Senator MORGAN. And that there was an interval of about 40 feet between the bottom of their borings and the bottom of the borings that he made?

Mr. NOBLE. I think that he found, between the points where the borings were taken by the Isthmian Canal Commission, places where the rock was deeper by 40 feet.

Senator MORGAN. Do you now think that it would be practicable to put in a dam at Bohio that would answer the same purpose that it was expected would be answered by the dam that was proposed by the Walker Commission?

Mr. NOBLE. I believe that a dam could be put in at Bohio that would answer the purpose.

Senator MORGAN. A dam could be put in there that would answer the purpose?

Mr. NOBLE. Yes, sir.

Senator MORGAN. If you were building a lock canal, which location would you prefer to-day—the location at Gatun or the one at Bohio?

Mr. NOBLE. The one at Gatun.

Senator MORGAN. Will you please state the reasons for that?

Mr. NOBLE. One reason is that I think the material at the site at Gatun is much less permeable than that at Bohio, and then I think that the resulting canal is much better by reason of adding about 10 miles of broad, open navigation to the canal route in place of a narrow cut.

Senator MORGAN. I have understood (perhaps I am mistaken about it) that in the borings that Mr. Wallace has made at Bohio he has gone down to what we call solid rock—that is, basalt, or some rock of that hard, tough nature; but in the borings at Gatun, if I correctly understand it, no rock has been reached at all?

Mr. NOBLE. It is believed to be the hard, indurated clay, somewhat of the character of that at Culebra.

Senator MORGAN. Yes; but that can not be called a rock?

Mr. NOBLE. It has been called a rock.

Senator MORGAN. Improperly, has it not?

Mr. NOBLE. Well, it is pretty hard to say, Senator. Some of it has the characteristics of rather soft rock. It seems to me sometimes that people make some difference as to the point of view of looking at it.

Senator MORGAN. But if it is rock, it is not rock of the strength and consistency of that which Wallace has developed by his borings at Bohio?

Mr. NOBLE. I should think not.

Senator MORGAN. It is not?

Mr. NOBLE. I should think not.

Senator MORGAN. As a foundation for a dam, I suppose the rock at Bohio is stronger and better, of course, than this hardpan or indurated clay or rock, or whatever it may be called, at Gatun?

Mr. NOBLE. I do not think that for an earth dam the difference is material at all.

Senator MORGAN. For an earth dam?

Mr. NOBLE. Yes.

Senator MORGAN. How will it be for a stone dam or a concrete dam?

Mr. NOBLE. For a concrete dam carried down to bed rock, assuming that a dam of that kind could be built at either place, I should think the material at Bohio was better.

Senator MORGAN. By "bed rock" do you mean this material at Gatun?

Mr. NOBLE. I was referring to it in that connection; yes, sir.

Senator MORGAN. But it is not rock.

Mr. NOBLE. I will say the material, if you please, then; the indurated clay at Gatun.

Senator MORGAN. About the hardest description that they can give to it is "indurated clay?"

Mr. NOBLE. Yes.

Senator MORGAN. Is not that so?

Mr. NOBLE. Yes; I should think so.

Senator MORGAN. So it is not rock at all. It was not an original formation of rock?

Mr. NOBLE. No; it is not a rock as we understand the term "rock" ordinarily; no, sir.

Senator MORGAN. That is what I am trying to get at—the common understanding—because we have to measure things by the common understanding. We do not understand it scientifically. Now, are you entirely satisfied, after a full and careful examination of the dam proposed by the minority of the consulting engineers at Gatun, that it is safe and satisfactory in every degree?

Mr. NOBLE. Entirely so.

Senator MORGAN. You think that is so?

Mr. NOBLE. I think that plan is entirely adequate for a dam at Gatun that will be safe and answer its purpose perfectly.

Senator MORGAN. Yes; and that the lock site with a flight of three locks is in every respect safe and sufficient for the accommodation of the ships that pass through?

Mr. NOBLE. Oh, I think so, sir. There is a little risk in any mechanical structure; but I think it is so small in the case of locks, I believe experience shows that so fully, that we may say with all reason that that is a safe and sufficient adjunct of navigation.

Senator MORGAN. Do you think that the proposition of Mr. Bates—which I suppose you have examined—is equally safe?

Mr. NOBLE. I think that Mr. Bates's various projects imply so many more mechanical structures with gradually cumulative objections, so that the result is not quite so good.

Senator MORGAN. But the principle upon which his dam is located at Gatun and the other dam at Mindi is the same that is adopted by the committee of consulting engineers? The principle is the same?

Mr. NOBLE. Oh, I think that an adequate dam can be built at Mindi, from what information I have.

Senator MORGAN. The difference between the two is simply in the elevation?

Mr. NOBLE. And the number of structures. If a dam was built at Mindi, it would be an embankment across that natural depression.

They would still require a dam across the Chagres, somewhere. I suppose, between Gatun and the sea.

Senator MORGAN. Yes. Mr. Bates puts it exactly on the axis of this dam that is proposed by the minority of the committee.

Mr. NOBLE. But in addition to that he would have to have a dam, I think, across the Chagres between Gatun and the sea, in order to hold up his Mindi level.

Senator MORGAN. Yes. Would that be three dams?

Mr. NOBLE. That would be three dams, by the time you got into the level above Gatun.

Senator MORGAN. Yes; and the dam across the Chagres, then, would be a controlling work?

Mr. NOBLE. Controlling works; yes, sir.

Senator MORGAN. I suppose you mean for the dam at Mindi?

Mr. NOBLE. Yes, sir.

Senator MORGAN. And also for the dam at Gatun?

Mr. NOBLE. And also for the dam at Gatun. There would have to be controlling works in connection with a dam at Gatun to discharge the water in the pool between Gatun and Mindi, and there would also have to be controlling works to discharge the water between the Mindi pool and the sea. It is possible, however, that a site might be found for a single controlling works from the Gatun level into the sea at some point farther to the westward.

Senator MORGAN. I am merely speaking of his plan. I want to get an understanding of it as you understand it.

Mr. NOBLE. Yes.

Senator MORGAN. The dam that he puts across the Chagres River below Gatun is built, as I understood him, on the plan and principle of the dam at Assouan, in Egypt; and it has gates for letting out the flood waters, for controlling the waters?

Mr. NOBLE. Yes, sir.

Senator MORGAN. And it is only a controlling dam, if I understand it?

Mr. NOBLE. I think that is so; that is my understanding.

Senator MORGAN. While that would be an additional structure, it would add to the security of both the dam at Gatun and the dam at Mindi, would it not?

Mr. NOBLE. It would be absolutely essential to the stability of a dam at Mindi, otherwise the water would overflow it and wash it out.

Senator MORGAN. Yes. I will not go into the relative expense, because that is a matter of calculation.

Mr. NOBLE. Yes.

Senator MORGAN. It is a matter that is all figured out, and the engineers have stated it, and I suppose Mr. Bates has stated it correctly. Now, taking the project of the minority of the Board of Consulting Engineers as presented to the Government and to this committee—taking that plan, which you say you think is entirely secure, and comparing it with a sea-level route from bay to bay, to which would you give the preference?

Mr. NOBLE. I should adhere to the preference expressed by the minority for the lock-level canal.

Senator MORGAN. You would give the preference to the lock-level canal over the sea-level?

Mr. NOBLE. Yes, sir.

Senator MORGAN. Would you have any difficulty in accepting, as an engineer, a plan of a canal that should be a sea-level canal as far as Gamboa, or in that vicinity, say Obispo, a lock canal from that point across to, say Miraflores, and a sea-level canal out to the Bay of Panama? Would you have any difficulty in accepting that?

Mr. NOBLE. I should think that would make a serviceable canal. It would sacrifice many of the advantages of the lock-level canal proposed by the minority, and it would have many of the disadvantages, as the minority considers them, of the sea-level route.

Senator MORGAN. The advantages that you speak of, proposed by the minority, that would be thus sacrificed, are the advantages of navigation, are they?

Mr. NOBLE. Yes, sir; mainly.

Senator MORGAN. Is there any other that you can think of, of an important character?

Mr. NOBLE. I think the formation of the lake from Gatun to Obispo simplifies the matter of maintenance considerably by providing a larger lake into which all the streams, large and small, would be received at a sufficient distance from the canal to prevent any material amount of deposit in it.

Senator MORGAN. So the advantage of safer and quicker navigation and the advantage in the cost of maintenance are the two leading features?

Mr. NOBLE. They are the leading features.

Senator MORGAN (continuing). That you would expect to obtain by substituting a lock canal with a dam at Gatun for a sea-level canal from Gamboa to Gatun?

Mr. NOBLE. Perhaps I should add, also, the materially greater cost of a canal built at sea level to Gamboa.

Senator MORGAN. The canalization would not be a very expensive work between the Bay of Limon and Gamboa at sea level, would it?

Mr. NOBLE. I think that would have to be answered by reference to the estimates of the majority in the report of the board.

Senator MORGAN. The heavy cost would come in between Bohio and Gamboa, then, in that project?

Mr. NOBLE. Yes; between Bohio and Gamboa.

Senator MORGAN. And that would be ditching?

Mr. NOBLE. Yes.

Senator MORGAN. But that could be done by dredging, could it not?

Mr. NOBLE. There is a great deal of rock in there, Senator.

Senator MORGAN. But can you not dredge rock as well as you can dig it and haul it out?

Mr. NOBLE. No; I think not.

Senator MORGAN. I do not mean that dredges can take it up and bodily carry it out; but can you not break it up and carry it out?

Mr. NOBLE. That can be done, Senator, but not so conveniently as in the dry, nor so cheaply.

Senator MORGAN. Would there not be a great advantage in getting rid of the spoil in favor of a sea-level canal between the Bay of Limon and Gamboa over a haul by railroad?

Mr. NOBLE. I could not say as to that without going into a detailed study of the matter, which I have not done.

Senator MORGAN. But would you not believe, as a general engineering proposition, that the dump that would be taken out of the sea-level canal—the spoil, we will call it—could be hauled off in barges into the sea and distributed out there in whatever way you chose to do it cheaper than you could do it by rail?

Mr. NOBLE. I would not undertake to say as to that. I can see a difficulty at once in carrying out that scheme, in this: That you could not commence your excavation at Culebra, perhaps, until after you had gotten your sea-level canal to Obispo.

Senator MORGAN. Now, on the other side, in the case that I am supposing of a sea-level canal, say, to Miraflores or Pedro Miguel (I do not know which is the preferable location) out to the Bay of Panama, you would put your sea-gate or lock at the point where the high lands stopped and the sea-level canal came in? You would not have to have any additional gate out in the direction of the islands in the Bay of Panama?

Mr. NOBLE. Oh, no, sir. By excavating a deep channel to Miraflores of course you could extend the sea level there.

Senator MORGAN. Yes. You can extend the sea-level canal to Miraflores without any gate to regulate or control it, except at Miraflores?

Mr. NOBLE. Oh, yes, sir.

Senator MORGAN. Yes. That is all I wanted to ask you.

Senator KITTREDGE. Going back, Mr. Noble, to the subject that you first touched upon, concerning the speed of vessels, in making the statement that you have upon that subject what size of ships did you use?

Mr. NOBLE. Can I see the report of the Board, Senator?

Senator KITTREDGE. Certainly.

Mr. NOBLE (after examining the report of the Consulting Board): We assume two sizes of ships, one 540 feet long by 60 feet beam and 32 feet draft. That represents somewhat closely the larger class of ships of the Union Castle Line, passing around the Cape of Good Hope from England.

Senator KITTREDGE. Is that about the largest type of ship now in use?

Mr. NOBLE. There are very few larger ships than that.

Senator KITTREDGE. I mean in common use.

Mr. NOBLE. There are very few larger ships than that, except on the North Atlantic routes. The other type (if I may complete my answer) was to be 700 feet long and 75 feet wide and 37 feet draft.

Senator KITTREDGE. Then in making the comparison upon which you based your statement regarding the difficulty of passage in the canal you took the larger size of ships?

Mr. NOBLE. The largest size of ships in ordinary use.

Senator KITTREDGE. How would it be for the ordinary vessels—the tramp boats?

Mr. NOBLE. The tramp boats of the present time would make the passage more quickly in either route, and that difference would be more large in favor of the sea-level route than of the lock route.

Senator KITTREDGE. To what size of ships do you think your criticism would apply regarding the passage of ships?

Mr. NOBLE. I do not know that I understand you.

Senator KITTREDGE. You say the tramp boats would pass easily?

Mr. NOBLE. Oh, in speaking of the tramp boat I was thinking of the ordinary size of tramp ship, that may be, say, approximately 350 feet long and 45 to 48 feet beam.

Senator KITTREDGE. Running up to what length?

Mr. NOBLE. Three hundred and fifty feet, say; anywhere less than 400, perhaps I should say.

Senator KITTREDGE. How would it be up to 500?

Mr. NOBLE. I do not know of any tramp ships—

Senator KITTREDGE. Well, other ships in use?

Mr. NOBLE. This particular dimension was 540 feet, you remember, Senator. I think the tramp ship, as we generally understand it, is almost invariably less than 400 feet long, and not much over and generally less than 50 feet beam.

Senator KITTREDGE. I was extending that to ships of larger dimensions. Is the next dimension the 540-foot ship you have mentioned?

Mr. NOBLE. Five hundred and forty by sixty.

Senator KITTREDGE. And is there any point below that where your criticism would not apply?

Mr. NOBLE. There must be a point below that where the time of passage would be more favorable to a sea-level canal. Without going into the matter in detail I could not say at what point that would be reached, but as you decrease the size of the ship the disadvantage of a relatively narrow waterway becomes less.

Senator KITTREDGE. Is there anything serious in even stopping a ship, as is done at Suez, to permit the passage of a ship going in the opposite direction?

Mr. NOBLE. It simply takes time.

Senator KITTREDGE. And not much time at that, does it?

Mr. NOBLE. That depends upon the distance between the passing places. That has all been taken into account in calculating these intervals given in this report.

Senator KITTREDGE. They have no difficulty in Suez in passing ships?

Mr. NOBLE. None whatever, except the delay.

Senator KITTREDGE. And the width of that canal now is about 118 feet, is it not?

Mr. NOBLE. I think that is it.

Senator KITTREDGE (continuing). As compared to a bottom width of 150 feet and a surface width of 200 feet on this canal, the sea-level canal. Is that right?

Mr. NOBLE. The surface width is considerably more than 200 feet in this canal, in the sea-level canal.

Senator KITTREDGE. In the sea-level canal?

Mr. NOBLE. In the sea-level canal the surface width would be considerably more than 200 feet everywhere except through the Culebra cut.

Senator KITTREDGE. What is the dimension of the canal through the Culebra cut under the lock plan?

Mr. NOBLE. Two hundred feet.

Senator KITTREDGE. Just the same?

Mr. NOBLE. Just the same; but the length is not anywhere nearly as much. That is to say, in the approaches to the deepest part of

the Culebra cut, in the lock canal, the channel is made considerably wider.

Senator KITTREDGE. For what distance is the width the same?

Mr. NOBLE. I think it is 4.7 miles.

Senator KITTREDGE. Are you quite sure that is the entire distance?

Mr. NOBLE. I would have to look at that.

Senator KITTREDGE. I wish you would, to be sure.

Mr. NOBLE (after examining report). That is the case, Senator.

Senator KITTREDGE. What is the distance?

Mr. NOBLE. 4.7 miles.

Senator KITTREDGE. How much greater rate of speed per hour will a boat be able to make in the lock plan than in the sea-level plan between the locks?

Mr. NOBLE. I have here a list of the rates of speed used in calculating these times of transit for each of these two types of ship in each channel width.

Senator HOPKINS. Just give those to the reporter.

Senator KITTREDGE. Is this list one that was prepared by yourself or by the minority together?

Mr. NOBLE. It is one that I prepared in studying up the matter for the minority. It does not appear in the minority records.

Senator KITTREDGE. And was it used?

Mr. NOBLE. It was used.

Senator KITTREDGE (continuing). In reaching your conclusions?

Mr. NOBLE. Yes, sir; it was taken by the minority.

Senator KITTREDGE. We will be very glad to hear them.

Mr. NOBLE. For a channel 1,000 feet wide by 45 feet deep—that is the channel in Lake Gatun—for example, from Bohio to Gatun—

Senator KITTREDGE. What is that distance?

Mr. NOBLE. It is rather a larger distance than that. I will have to give that correctly from the report here. [After examining report.] For 15.69 miles above Gatun the channel would be nowhere less than 1,000 feet wide at the bottom and 45 feet deep. Basing the calculation on those minimum dimensions, the estimated speed of a boat of type C (the boat of the smaller of the two types mentioned) is 10 miles an hour and of the larger 9 miles an hour.

Senator KITTREDGE. That is a gain of 1 mile an hour?

Mr. NOBLE. Of 1 mile; yes, sir.

Senator KITTREDGE. How much would you gain, then, in traveling that distance of 15 miles?

Mr. NOBLE. That comparison was between the two types of ship, Senator.

Senator KITTREDGE. Oh, between the two types of ship?

Mr. NOBLE. Yes, sir; that is followed by a width of 800 feet and the same depth for a distance of 3.86 miles.

Senator KITTREDGE. Now, then, let us take this 15-mile section.

Mr. NOBLE. Yes.

Senator KITTREDGE. What speed would you have in the sea-level canal for that distance?

Mr. NOBLE. These lengths are not quite coincident, Senator; but from $6\frac{1}{2}$ to 7 miles an hour for the smaller ship and $4\frac{1}{2}$ to 5 miles an hour for the larger ship.

Senator KITTREDGE. How much would you gain there in traversing that distance of 15 miles?

Mr. NOBLE. I shall have to estimate between those different forms of sea-level channel as well as I can, Senator, the difference of half a mile in the speed.

Senator KITTREDGE. Have not you it all figured out?

Mr. NOBLE. No; it is not all figured out here; no, sir.

Senator KITTREDGE. On what basis do you tell us that you make so much greater speed in the lock type than you do in the sea-level type?

Mr. NOBLE. It is based upon the ratio between the cross section of the channel and the cross section of the ship.

Senator KITTREDGE. Theoretically, then?

Mr. NOBLE. It is based upon observations taken by myself some years ago at the St. Clair Flats Canal and upon the investigations of German engineers on the movement of boats in canals. It is quite a complicated matter. It was treated at full length in the reports of the Board of Engineers on Deep Waterways and in the report of the first Isthmian Canal Commission, and that method is followed throughout.

Senator KITTREDGE. Then you have figured out this problem theoretically? Is that right?

Mr. NOBLE. I do not think the word "theoretically" is the proper one to use in that connection, because the figures are based upon a very large number of observations of facts.

Senator KITTREDGE. But you have not figured it out upon the basis that I have suggested, as I understand it?

Mr. NOBLE. I have taken the lengths of each one of these sections and applied the speeds resulting from those various observations.

Senator KITTREDGE. I notice in the minority report—I think it is the minority report—that the question of the use of buoys is considered. Do you contemplate the establishment of buoys from Gatun up to the point where the channel narrows?

Mr. NOBLE. At all the projecting points; certainly.

Senator KITTREDGE. Why is that?

Mr. NOBLE. That gives the navigator information as to the limit of deep water.

Senator KITTREDGE. How many buoys have you established in that 15-mile section, or how many do you contemplate?

Mr. NOBLE. We have not made any detailed estimate of it whatever.

Senator KITTREDGE. But you contemplate the location of them?

Mr. NOBLE. In general I could give you the locations where some of those buoys might be.

Senator KITTREDGE. Just tell us about where they would be, then, and how many there would be.

Mr. NOBLE. I would really not undertake to make a detailed layout for buoys in the channel.

Senator KITTREDGE. I understand; but it is a fact, is it not, that you contemplate the establishment of buoys?

Mr. NOBLE (indicating on map). Leaving Gatun, of course, it would be natural to put a buoy into this shoal water marked there; to put one certainly there; to put one, without doubt, here, to mark that point; to mark this at some suitable point along this ridge; to mark that, and to fully define this cut along here [indicating]. It might take four or five buoys in that section.

Senator KITTREDGE. The purpose of the location of those buoys is to indicate submerged banks, is it not?

Mr. NOBLE. Yes, sir.

Senator KITTREDGE. And that is just the point that the man used to riding the sea is afraid of, is he not?

Mr. NOBLE. It is the thing that he wants very much for safety. Senator.

Senator KITTREDGE. I understand; but he is afraid of submerged banks, is he not?

Mr. NOBLE. If they were not marked he would certainly be afraid to go anywhere near where he supposed them to exist; but if they are marked, and well marked, they would permit him to use the channel. That is a matter of everyday experience in the Lakes.

Senator KITTREDGE. I understand; but the point is that you use them?

Mr. NOBLE. Certainly.

Senator KITTREDGE. And you must guide your ship within the limits of those buoys?

Mr. NOBLE. Yes, sir.

Senator KITTREDGE. That is right, is it not?

Mr. NOBLE. That is true.

Senator HOPKINS. You say that is an everyday experience in the Great Lakes?

Mr. NOBLE. Yes, sir; the channels are all marked there by buoys. Between Lake Superior and Lake Erie there are between 40 and 50 limits of channels that are marked by buoys, and most of them are marked by gas buoys, so that they can be run by day or night. Most of them are marked—if I may go a bit further into the matter——

Senator HOPKINS. Yes.

Mr. NOBLE. Most of them are marked by center-line ranges, where they can be placed, so that a boat can see by ranges where the center of a channel is, and by the gas buoys where the limits of the channel are.

Senator SIMMONS. Is not that also a matter of everyday experience in the approaches of our harbors?

Mr. NOBLE. Oh, yes; wherever a ship approaches land.

Senator SIMMONS. And in the ordinary case of the harbors in the Lakes you can not mark those channels as clearly and distinctly by buoys as you can mark the channel off in this lake navigation here, can you?

Mr. NOBLE. I do not know that I catch that.

Senator SIMMONS. I say, in the approaches of our harbors you can not, by the use of buoys, mark off the channels quite so well as you could mark off the channels through this small lake here by buoys and lights, can you?

Mr. NOBLE. In approaching a harbor of course a boat would not know so definitely where it was.

Senator SIMMONS. That is what I mean.

Mr. NOBLE. But in this lake navigation, a vessel starting from a known point and having to go only a short distance before it picks up a buoy can not well go wrong.

Senator KITTREDGE. Did you read Mr. Bates's testimony?

Mr. NOBLE. No, sir.

Senator KITTREDGE. Or Mr. Parsons's?

Mr. NOBLE. No, sir.

Senator KITTREDGE. The statement was made by Mr. Bates, and confirmed by Mr. Parsons, that while the minority had in its report recommended the establishment of locks of navigable dimensions, 900 by 95 feet, the plans which have been sent up here disclose the fact that the usable length of these locks is only 790 feet. Have you any statement to make regarding that criticism of your plan?

Mr. NOBLE. The locks are estimated and, I suppose, drawn on the maps for a length between gates of 955 feet, of which 55 feet is ample to provide for the movement of the gate at the lower end of the lock, leaving 900 feet that is clearly usable.

Senator KITTREDGE. That is the supposition?

Mr. NOBLE. That is the fact, Senator.

Senator KITTREDGE. The statement is made by each of them that the plans do not show 900 feet, but, instead, 790 feet; and Mr. Parsons's statement was, given to us Tuesday, that he had made a personal examination of the plans in the office of the Commission. Have you any knowledge upon that subject?

Mr. NOBLE. No; I have no knowledge whatever. I made the plans of the lock myself, Senator; I made the estimates of them. I sketched out the plans of the lock personally, and I personally made the calculations of the quantities. They are based upon a length of 955 feet in every lock chamber and of 900 feet clear available space for a vessel, and the figures given in these estimates of the minority provide for that.

Senator HOPKINS. They contend that there is not space there for three such locks.

Senator KITTREDGE. That there is not hill enough.

Mr. NOBLE. I heard this morning that that question has been raised, and of course I do not know, but I do not think that the surveys have extended quite far enough, perhaps; but there are hills enough there at Gatun to put that lock in. That we have from the general information.

Senator DRYDEN. Mr. Noble, if it is true that the usable length of these locks is but 790 feet, and that it is practically impossible to make them longer, would it change your views as to the desirability and advisability of a lock canal?

Mr. NOBLE. Why, I can not conceive that that situation can arise, Senator. If the site there should be short there is plenty of ground in Gatun, by shifting the lock site laterally, to get any length of ground you want.

Senator DRYDEN. It was explained, as I understand it, that both ends of the locks would so project beyond the hills as to extend out into the air without any practical opportunity of furnishing the ends of those locks with supports, and that that is the reason why these locks can not be elongated.

Mr. NOBLE. I do not think that is so. There is a scarcity of topographical information at Gatun, but there is no doubt, as I understand it, that by shifting the locks laterally you can get in as much length there as you want. That range of hills is wide enough.

Senator DRYDEN. For the purpose of my question let us conclude that this criticism is correct, that the locks can not be lengthened beyond the scale proposed and beyond the length proposed. In view of the fact that we are already constructing vessels 780 feet in length,

would it materially detract from the desirability of a canal of this type if that should be found to be true?

Mr. NOBLE. I do not think that is the alternative, Senator. We might be against a situation the same as that of the Isthmian Canal Commission in 1900. The site at Bohio was only sufficient for two locks. The summit level was practically the same as now, and the Commission then decided to increase the lift rather than to incur some additional expense for moving the locks farther over. That remedy was available there. Now, that remedy is still available here.

Senator KITTREDGE. What do you mean by "increasing the lift?"

Mr. NOBLE. Increasing the lift so as to have two locks instead of three. I would much rather seek a location a little farther to the east.

Senator KITTREDGE. Increasing it to what extent?

Mr. NOBLE. Oh, I do not think you would have to go over there very far, Senator.

Senator KITTREDGE. I mean, increasing the lift to what extent?

Mr. NOBLE. Oh, I have no objections myself, after having studied the matter over very carefully, to overcoming the lift at Gatun in two lifts instead of three.

Senator KITTREDGE. Of 42½ feet each?

Mr. NOBLE. Of 42½ feet each. That is practically what we did at Bohio four years ago or five years ago.

Senator KITTREDGE. What is the highest lift of lock that you know of now in existence?

Mr. NOBLE. I think the highest lift that I know of to a certainty is—well, the highest lift that I have in mind is one planned and built, I think, at about 30 feet, somewhere in the South, on some one of the rivers; not a large ship canal, however, I think.

Senator HOPKINS. How many feet?

Mr. NOBLE. I think something over 30. In connection with the work of the Deep Waterways Board we had to design a flight of locks to overcome the great lift in the Niagara River at the falls, and we adopted there a lift, I think, of 40 feet and went into the calculations of strength of all the parts, the designs of the gates, and everything in connection with it in very great detail.

Senator KITTREDGE. To what extent had your Board and have you in your possession information concerning the character of the Gatun Hills in the vicinity of the proposed locks?

Mr. NOBLE. There are some borings in there, but I do not think they extend the full length of those locks. There was not time to get all that information.

Senator KITTREDGE. Do you not think it was desirable to have that information?

Mr. NOBLE. Oh, extremely.

Senator KITTREDGE. Do you not think that the minority of your board and this committee ought to have all possible information relating to that subject before adopting the lock plan?

Mr. NOBLE. We could not get it. We had no doubt whatever, Senator, that by one of those two alternatives, and no appreciable doubt that by adopting the first (that is, by changing the location), the difficulty could be met. That was a matter that we discussed at

the time. I was not aware that this site was short, and I do not think that we had the facts to show whether it was or not; but at the time that we were designing these locks, in view of the shortness of the time and the information, we decided to make a location where it seemed to be certain they could be built beyond a reasonable doubt, but with the further assurance that we could move them over where the hill formation was broader.

Senator KITTREDGE. The reason I ask this question, Mr. Noble, is this: You remember appearing before this committee four or five years ago?

Mr. NOBLE. Yes, sir.

Senator KITTREDGE. And recommending strongly the Bohio dam? On that occasion you told this committee that there was no doubt whatever about ability to go to bed rock and lay the foundations of the Bohio dam. That was right, was it not?

Mr. NOBLE. Yes; on the basis of the borings we had then; we were very certain.

Senator KITTREDGE. I understand. Now, then, when more careful examinations and borings were made, the fact was disclosed that instead of striking bed rock at 120 feet below sea level you had only struck boulders, or at least had not struck the deepest point at that place. That is right, is it not?

Mr. NOBLE. I think the latter is the case, Senator.

Senator KITTREDGE. And when more careful borings were made, the lowest point at the Bohio dam site was 168 feet below sea level. That is right, is it not?

Mr. NOBLE. I think that is correct; yes.

Senator KITTREDGE. Now, ought we not to have more careful borings and information concerning the character of the country at Gatun than the minority of the committee possessed and than you are able to give us now?

Mr. NOBLE. We believe that the information we have, Senator, is sufficient to make it certain that we can build the dam and the locks at Gatun. We do not think it is sufficient to enable us to say that these are the best possible locations in that neighborhood for those structures. But there is more doubt about the locks than there is about the dam in that connection, because the dam is determined very largely by the surface conditions and the topography.

Senator KITTREDGE. You say there is more doubt about the locks; what doubt is there?

Mr. NOBLE. Because the borings are not sufficient, are not what one would demand before constructing a lock. Before going to construct a lock there, Senator, we would take borings in that neighborhood and study up the whole topography, the whole situation, surface and subsurface, in great detail. That is a matter that would require many months.

Senator KITTREDGE. Suppose that the lock plan is adopted by Congress and then you make further and more careful investigations and the fact is developed that you can not build locks there—what then?

Mr. NOBLE. I do not think you can apprehend any such result as that, Senator.

Senator KITTREDGE. That is precisely the result that happened at Bohio, is it not?

Mr. NOBLE. It certainly is. The project of sinking caissons to full depth at Bohio is, I think, impracticable.

Senator KITTREDGE. And you advised that that be done at Bohio?

Mr. NOBLE. Yes; that is true.

Senator KITTREDGE. When you were before us four years ago?

Mr. NOBLE. Yes.

Senator KITTREDGE. And stated that you would not recommend any other type of plan at that point?

Mr. NOBLE. I think that you can make a water-tight dam at Bohio. I read what Mr. Burr has said in that connection before this committee, and I concur in that—that that is physically possible.

Senator KITTREDGE. I wish that during the recess, if we take one. Mr. Noble, you would make an examination of the records in the office of the Canal Commission and tell us whether you are mistaken, or Mr. Parsons and Mr. Bates, regarding the usable dimensions in length of the lock at Gatun.

Senator HOPKINS. My remembrance of Mr. Parson's testimony was that there was territory enough there, just as stated by Mr. Noble; and that if the present situs of the proposed lock was insufficient for a flight of three locks 900 feet in the clear, they could make a change so as to do that. Now, am I correct in that?

Senator KITTREDGE. There is not enough hill; they would have to go away out in the swamp.

Senator HOPKINS. No; my understanding was just the reverse.

Senator KITTREDGE. No; he said you would have to build up.

Senator HOPKINS. Where is his testimony in the afternoon? Have you that evidence printed, Mr. Chairman?

The CHAIRMAN. I think that is it [handing testimony to Senator Hopkins].

Senator KITTREDGE. Let me ask you another question, Mr. Noble. Tell us the plans of the locks which you devised. Did you have any safety gates?

Mr. NOBLE. Yes, sir.

Senator KITTREDGE. What were the dimensions of those?

Mr. NOBLE. The same as the lock gates.

Senator KITTREDGE. And you regard them as essential and necessary in the construction of the locks?

Mr. NOBLE. They have not been used heretofore, Senator; but we thought that in a great work of this kind it would be advisable to use them.

Senator KITTREDGE. And you agreed that that should be done in this case?

Mr. NOBLE. Oh, yes.

Senator KITTREDGE. I notice in the majority report the statement that by a vote of 11 to 2 the size of locks, if locks were used, was to be, in usable dimensions, 1,000 feet by 100. That is right, is it not?

Mr. NOBLE. That is right.

Senator KITTREDGE. Why was that reduced to 995 feet, usable dimensions?

Mr. NOBLE. On further discussion of the matter, the minority came to the unanimous opinion that that would be sufficient to meet the requirements of the act.

Senator KITTREDGE. Was that discussion had in full board?

Mr. NOBLE. No; that was the discussion of the minority, after the board had divided on the main issue of a sea-level versus a lock-level canal.

Senator KITTREDGE. I turn to the testimony, Mr. Noble, that you gave before this committee four or five years ago; and, in speaking of the Bohio dam, I read you the following:

"Senator HARRIS. That no form that the water passed through or under could be safely depended upon?"

"Mr. NOBLE. I am not at all sure that there would be any very great danger of the destruction of such a dam, although the risk would be conceivable, perhaps, even if a small area were thus exposed; but the amount of water passing under the dam would increase with the area of cross section of the sand through which the water would pass, and I think that if the dam were not made impermeable in the whole section, the amount of filtration might be so great as possibly to cause trouble with the water supply."

Do you still subscribe to that?

Mr. NOBLE. No; I have gone into the matter considerably since that time, and have made use of the latest investigations in regard to the amount of water that will pass through a given thickness of sand; and I must say that I have been very thoroughly convinced by the arguments that have been presented.

Senator KITTREDGE. By whom?

Mr. NOBLE. By Mr. Stearns, mainly; by Mr. Morison to some extent.

Senator KITTREDGE. How long before Mr. Morison's death did you discuss this question with him?

Mr. NOBLE. Perhaps a year or so before his death. I think that my mind was still open on the subject until Mr. Stearns presented his experiments in great detail. I saw the samples of the materials used in the filtering experiments; and then, taking into consideration the dimensions of the dam that the minority proposes, unprecedented in width, I can not see any possibility of any amount of water getting through there that will affect in any appreciable degree the water supply of that canal, or that will involve any hazard whatever to the structure.

Senator KITTREDGE. I read further from your testimony in that connection, Mr. Noble, in answer to a question by Senator Hawley. I will read his question:

"I should suppose a temporary dam would require as much protection against the seepage and leaking as the permanent dam.

"Mr. NOBLE. It is necessary that the permanent dam shall be free from much seepage to maintain the water supply, but the temporary dam would simply be used during construction, and moderate seepage would not be a very important matter.

"The CHAIRMAN. Then I understand your answer to mean that you would not consider a dam sufficiently permanent that admitted of seepage through the strata upon which it rested?

"Mr. NOBLE. I should not consider it to possess the requisite amount of certainty as a protection for that navigation. I could not say that it would give way, and I could not predict with certainty that the seepage would be very serious, but I should apprehend it."

You were then speaking of the Bohio dam. Do you still subscribe to the statements that you made there?

Mr. NOBLE. I think the seepage through the Bohio dam would be more than it would be under the Gatun dam for several reasons, Senator. One is that the material there, as shown by the borings, is coarser, a larger proportion of it; another is that the material there, as shown by borings, is, in the immediate vicinity of the dam, in continuous connection with the river. But I will say this, that my apprehensions in regard to the amount of water that will pass under a dam through sand and gravel are much less than they were five or six years ago. I do not believe that with the width of the Gatun dam any appreciable amount of water can pass.

Now, Mr. Stearns can go into that very much more fully with you than I can, but I will state—

Senator KITTREDGE. He will be here.

Mr. NOBLE. I will state frankly that I have undergone a change of opinion in the last four or five years just on that point.

Senator KITTREDGE. You have changed your opinion?

Mr. NOBLE. That I have less apprehensions of the dangers of seepage through gravelly, sandy material than I had at that time.

Senator KITTREDGE. But at Gatun, Mr. Noble, while the borings have been to the depth of 258 feet, you have not yet reached the point of solid rock? That is right, is it not?

Mr. NOBLE. We have reached the point of water-tight material, I think, Senator.

Senator KITTREDGE. You have reached the point of the indurated clay?

Mr. NOBLE. Yes, sir.

Senator KITTREDGE. Never below that, have you?

Mr. NOBLE. I think not.

Senator KITTREDGE. You have not gone through the indurated clay to solid rock at any point at Gatun, have you?

Mr. NOBLE. Not to my knowledge; I think not.

Senator KITTREDGE. Can you assure us that if you go through that clay into solid rock you will find any different conditions than were developed at Bohio after further and more careful investigations were made?

Mr. NOBLE. If we should have a dam there, Senator, half a mile wide, with the amount of fine material that we know to exist at Gatun immediately under the surface of the earth, I should not apprehend any danger from any amount of seepage that we could reasonably anticipate, and I could conceive of no possible danger from any material we should find below the indurated clay.

Senator KITTREDGE. How many borings were made across the Chagres Valley under the location of the Gatun dam?

Mr. NOBLE. I can not answer that offhand.

Senator KITTREDGE. Will you not look at the maps and answer my question?

Mr. NOBLE. I do not think I can answer that from this drawing. This purports to give the number of new borings at Gatun. Those shown on the profile are—

Senator MORGAN. There is a blueprint there that gives it more completely.

Mr. NOBLE (after examining papers). If I count correctly, Senator, there are 36.

Senator KITTREDGE. That includes the borings under the Gatun locks, does it not?

Mr. NOBLE. I would have to look at the contour maps to get that. I think not. Very likely this will show it.

Senator KITTREDGE. I think you will find that that covers the borings under the locks, as you originally planned them out, as well as across the valley.

Mr. NOBLE. I could not say as to that from this plat.

Senator KITTREDGE. I will show you Mr. Stevens's testimony upon that subject; perhaps you can tell me from that. I am not particular to have the exact number. Leave the lock feature out of the question; just take it under the dam.

Mr. NOBLE (after examining papers). If I count correctly, Senator, there are 39 borings taken at the site of the dam, of which 32 were on a continuous line across the site.

Senator KITTREDGE. How many?

Mr. NOBLE. Thirty-two, and about five or six more were on a continuation of that line, as I think it might be considered, probably.

Senator KITTREDGE. Those are marked upon plate what?

Mr. NOBLE. Those are marked upon plates 11 and 12.

Senator KITTREDGE. How many borings were made at the site at Gamboa at the time you gave your testimony four or five years ago?

Mr. NOBLE. At Bohio?

Senator KITTREDGE. Yes.

Mr. NOBLE. I would have to count them up.

Senator KITTREDGE. About how many?

Mr. NOBLE. Oh, they were three or four hundred feet apart, as I remember it. I would have to trust to memory for that.

Senator KITTREDGE. And the distance there between the extreme ends of the dam was what?

Mr. NOBLE. I would have to count that up.

Senator KITTREDGE. About 3,000 feet, was it not?

Mr. NOBLE. Somewhere in that neighborhood; yes, sir.

Senator KITTREDGE. The distance between the ends of this dam is what?

Mr. NOBLE. I believe it is about 7,000 feet.

Senator KITTREDGE. It is 7,700, is it not? I think that figure is stated in your report.

Mr. NOBLE. If it is stated in the report, of course that is correct. I think likely, following up the crest line of the dam.

Senator KITTREDGE. And in the distance of 7,700 feet—a mile and a half, in round figures—you have made how many borings?

Mr. NOBLE. Thirty-two, I think, on the transverse line.

Senator KITTREDGE. And how far apart are those borings?

Mr. NOBLE. The distances vary.

Senator KITTREDGE. From what?

Mr. NOBLE. I do not see any distance here that appears to exceed about 300 feet. Here is one, I think, of about 400 feet, on the top of the hill. Now, they vary there about 200 feet apart, and in one place I think they are 400 feet apart.

Senator KITTREDGE. Then they run from 200 to 400 feet apart there—is that right?

Mr. NOBLE. In the closest part they are 100 feet apart. I can give those dimensions exactly here. The closest pair that I note here are 97 feet apart.

Senator KITTREDGE. Where is that point?

Mr. NOBLE. Shall I describe it by stations, Senator? It is in the shallower of the two troughs. The next, the distance next to that between two completed borings, omitting the one that was only sunk a few feet, is 393 feet.

Senator KITTREDGE. And that is in the same trough, is it not?

Mr. NOBLE. In the same trough; yes, sir.

Senator KITTREDGE. And to what depth do those borings go?

Mr. NOBLE. One is about 170 feet and the other about 180. The borings go to about 180 feet below mean tide.

Senator KITTREDGE. Do you find any point upon that map indicating borings at a shorter distance?

Mr. NOBLE. Shorter than 97 feet?

Senator KITTREDGE. Yes. Look at the trough where it runs down to 258 feet.

Mr. NOBLE. No; I do not see anything nearer than that.

Senator KITTREDGE. What is the distance between the borings in that trough where the maximum depth is 258 feet?

Mr. NOBLE. The maximum distance is 209 feet. That is the maximum distance in the trough.

Senator KITTREDGE. And what is the maximum distance, you say, between any of these borings—400 feet?

Mr. NOBLE. Three hundred and ninety-three feet, I think.

Senator KITTREDGE. Three hundred and ninety-three feet. Can you assure us that borings nearer together would not disclose the same condition of affairs that the careful borings made by Mr. Wallace, or under his direction, indicated at Bohio?

Mr. NOBLE. I should not expect them to, Senator.

Senator KITTREDGE. We did not expect it at Bohio, did we?

Mr. NOBLE. No, no; but the formation here, I think, would lead to less doubt than it did at Bohio. At Bohio the formation was of volcanic rock, and here it is of clay. As a matter of absolute mathematical certainty we can not tell that without more borings; but I can not conceive of any material down there that would affect the stability of the Gatun dam.

Senator KITTREDGE. The great trouble regarding the sand and gravel at Bohio was developed when you reached the depth of 168 feet, was it not?

Mr. NOBLE. We found a greater depth of sand and of gravel at Bohio, and an additional depth of enough to make the methods which we proposed to use for creating an impermeable curtain there impracticable.

Senator KITTREDGE. So you advised against the construction of a dam at Bohio for that reason?

Mr. NOBLE. I think the Gatun site is the better one. I think Gatun, all around, is the better site. I think that with my present information I would advise the construction of a dam at Gatun even if the conditions at Bohio were exactly what we had supposed them to be in 1900.

Senator HOPKINS. But, as I understand you, a safe dam could be built at Bohio?

Mr. NOBLE. Oh, I think so.

Senator MORGAN. Did the commission—I will call it the joint commission; I do not know how to denominate it—did the Board of Consulting Engineers take into consideration and study the question of the construction of a dam at Bohio, at the place or near the place and on the plan that was reported favorably by the Isthmian Canal Commission?

Mr. NOBLE. I think the site that the Board used there was the site adopted by the Frenchmen. Perhaps General Davis can tell me about that.

General DAVIS. What is that?

Mr. NOBLE. The site that was studied at Bohio was the old French site, was it not?

General DAVIS. Oh, yes; yes.

Mr. NOBLE. The site adopted by the Isthmian Canal Commission in 1900 was chosen for the reason that the borings indicated rock farther down at the French site than at the one subsequently developed.

Senator KITTREDGE. Some 40 feet lower?

Mr. NOBLE. Yes. Now, Mr. Wallace's further borings showed that there was not any very material difference; the rock was a little lower down than had been supposed at the French site and very much lower down than had been supposed at the Commission's site.

Senator KITTREDGE. I have understood you—you can correct me if I am wrong about it—to say that the Board of Consulting Engineers—that is, the Board of which you were a member—discarded the plan of a dam at Bohio in consequence of the fact that Mr. Wallace had, by more complete borings, found that they had not struck solid rock within 40 feet, or about 40 feet, of the distance that they reported?

Mr. NOBLE. I think, Senator, that the minority would have chosen Gatun anyway.

Senator KITTREDGE. Anyway?

Mr. NOBLE. Yes.

Senator KITTREDGE. In preference to Bohio?

Mr. NOBLE. In preference to Bohio.

Senator KITTREDGE. So that the Bohio plan was really not studied carefully by the Commission?

Mr. NOBLE. Oh, I think so. I think it was studied carefully by the Commission, but—

Senator KITTREDGE. And rejected?

Mr. NOBLE. And the other preferred.

Senator KITTREDGE. Yes; rejected in favor of the Gatun proposition?

Mr. NOBLE. Yes.

The CHAIRMAN. Mr. Noble, what would be the objection to putting two locks at Gatun instead of three and making them 1,000 feet in length? What would be the objection to that?

Mr. NOBLE. Aside from the objection to the 1,000 feet in length, which is not a very serious one, of course, as far as I am concerned, in my opinion, there would not be any serious objection. I have no fear of a 42-foot lift.

The CHAIRMAN. That would be the only one?

Mr. NOBLE. That would be the only one; yes. I think that is true; I can think of no other.

Senator KITTREDGE. That would be an unusual and an untried structure, however; would it not?

Mr. NOBLE. Yes; but not an unconsidered one, Senator, because the previous Isthmian Canal Commission had considered the same thing.

Senator HOPKINS. You would not consider it a dangerous lift then?

Mr. NOBLE. Oh, no. I look upon it as exactly parallel to the problem of a bridge span. If you increase the span, you must increase the cross section, increase the strength in proportion.

Senator HOPKINS. It is on the same principle; if you increase the strength of the thousand-foot lock where you raise 42 feet, it is just as easy to raise 42 feet as it is 20 or 30?

Mr. NOBLE. Oh, yes.

Senator HOPKINS. My information is (and I will ask you whether I am correct or not) that at the Soo they have increased the lift from 10 to 20 feet.

Mr. NOBLE. Yes, sir. The old State locks at the Soo, opened for navigation in 1855, overcame that lift, which then was about 18 feet in two locks, dividing it about equally. At that time that was considered a rather high lift for a lock. Then in 1870, when the improvements were undertaken there by the General Government, it was decided in the new lock, parallel to the old ones, to adopt a single lift, and the wisdom of that was very strongly questioned. It was unprecedented at that time, and there were just as many doubters, I think, about the feasibility and propriety of a lift of 18 feet then as there would be about a 42-foot lift now. It worked perfectly successfully.

The CHAIRMAN. As I understand it, the whole plan at Gatun is somewhat unusual, is it not, anyway, for the three locks? The proposition to put in two would not be much more unusual than it would be to put in three, would it?

Mr. NOBLE. In respect to lifts, Senator, it is an advance from any former practice. There is another objection to a 42-foot lift that might be brought up, but in this case it is not important. That is, that it requires a little more water, of course, to fill a lock 42 feet deep than it does to fill one 30 feet deep; and you would sooner have to supply an additional water supply as commerce increased.

The CHAIRMAN. It would take no more water to fill two than it would three, would it?

Mr. NOBLE. May I illustrate that a little bit in detail? Perhaps it will not take too much time.

The CHAIRMAN. Certainly; certainly.

Mr. NOBLE. Suppose, Senator, that a vessel were bound down from the summit level, and that a boat had just gone down. Suppose a boat had just gone down, leaving the water all at the lower levels. In the lower lock, of course, it would be at the level of the lower pool. In the middle lock it would be one lift above that, and at the upper lock it would be one lift above that, and that would be a lift below the summit level. Then suppose another boat followed it. They would, in the first place, have to fill the upper lock. That would take, in case of the three-lock system, we will say, 30 vertical feet of water.

Now, when the upper gates are closed, the next operation would be

to open the valves and fill the lock below; and that chamber full of water, that 30 feet of water in the upper lock, would raise the water in the middle lock until they would be at a common level. Then the vessel would pass through, and so on. Now, that means that they draw out one lock full from the upper level in passing that ship down. In the case of the 42-foot lift that lock full would be measured by the 42 vertical feet.

Senator KITTREDGE. Do you know of any locks constructed as these are supposed to be, in flights, with a lift aggregating 85 feet?

Mr. NOBLE. At Lockport the canal locks are about that; I think there are 10 or 11 lifts, however.

Senator KITTREDGE. What are the usable dimensions of those locks?

Mr. NOBLE. There is no ship canal anywhere with a flight of three locks overcoming a lift of 85 feet.

Senator KITTREDGE. That is what I meant.

Mr. NOBLE. There is no large ship canal; no, sir.

Senator KITTREDGE. Is there any large ship canal that you know of where they have locks in flights of two, with an aggregate lift of 60 feet—30 feet each?

Mr. NOBLE. No, sir; no, sir.

Senator KITTREDGE. What is the largest lock for a ship canal now in use?

Mr. NOBLE. I think probably the Soo Canal has the largest lock and the largest lift.

Senator KITTREDGE. What are the dimensions of that lock?

Mr. NOBLE. Eight hundred feet long and 100 feet wide, with a lift of probably, I might say, 20 feet. It varies a little.

Senator KITTREDGE. And that is a single lock?

Mr. NOBLE. That is a single lock; yes, sir.

Senator KITTREDGE. By "800 feet" do you mean usable dimensions?

Mr. NOBLE. No, sir; that is the length between the gates.

Senator KITTREDGE. What is the usable dimension of that lock?

Mr. NOBLE. That would be about 750 feet.

Senator HOPKINS. Mr. Noble, you know of no such canal in existence, do you, as is proposed either by the majority or the minority of this Board of Consulting Engineers?

Mr. NOBLE. No, sir.

Senator HOPKINS. So that the construction of the canal on either type, either the sea level or the lock level, is exceptional?

Mr. NOBLE. The Panama Canal certainly is exceptional, no matter how built.

Senator KITTREDGE. Yes; and the locks that are spoken of here at the Gatun dam are no more exceptional than the construction of the entire dam is exceptional, are they?

Mr. NOBLE. I am not sure as to that, Senator. The Suez Canal is a sea-level canal, of course, and has been excavated for a greater length than the Panama Canal; and I should think that the parallel between Suez and Panama at sea level would be closer than between any two lock canals.

Senator HOPKINS. Still the climate, the topography of the country, and almost every element connected with the construction of the Panama Canal differ very widely from the Suez Canal?

Mr. NOBLE. Oh, those conditions, taken altogether, as a whole project, make it unprecedented, of course.

Senator MORGAN. You have never had any connection with this work as a commissioner for the construction of the canal?

Mr. NOBLE. No, sir.

Senator MORGAN. You declined an appointment on that Commission?

Mr. NOBLE. Yes, sir.

Senator MORGAN. Your work on it was confined entirely to what we call the Walker commission of examination, which made its report—this report here—and then, afterwards, to your service on the Board of Consulting Engineers?

Mr. NOBLE. That is my entire official connection with the Panama Canal.

Senator MORGAN. That is what I supposed.

Senator KITTREDGE. You were also a member of the Ludlow Commission?

Mr. NOBLE. Yes. That did not relate to the Panama Canal, however.

Senator KITTREDGE. I understand; I simply mentioned that as showing your experience in matters of this kind.

Mr. NOBLE. Yes.

(The committee thereupon took a recess until 2 o'clock p. m.)

AFTER RECESS.

Senator KITTREDGE. Mr. Noble, have you, during the recess, examined the drawings in the office of the Canal Commission in reference to the usable length of the locks proposed at Gatun?

Mr. NOBLE. Yes, sir.

Senator KITTREDGE. What do they show?

Mr. NOBLE. The published drawing seems to have been a draftsman's error in showing the lock chambers too short.

Senator KITTREDGE. What do those drawings show?

Senator HOPKINS. Let him furnish his answer.

Mr. NOBLE. I did not measure this. This information came from General Davis. The draftsmen also informed me that they had made a mistake and made the drawings too short; but the borings have not developed a lock site long enough for three locks.

Senator KITTREDGE. They have not?

Mr. NOBLE. No, sir.

Senator KITTREDGE. To what length have those borings developed a lock site?

Mr. NOBLE. They have developed a lock site long enough for two locks and something over.

Senator KITTREDGE. Of what length?

Mr. NOBLE. Of a usable length of 900 feet.

Senator KITTREDGE. That is the length that the majority of the Board suggests?

Mr. NOBLE. Yes, sir.

Senator KITTREDGE. This morning, just before recess, the question of increased lift was discussed—that is, having two locks of an aggregate lift of 85 feet. What effect would locks of that size have upon the use of water?

Mr. NOBLE. They require more water.

Senator KITTREDGE. How much more?

Mr. NOBLE. They require for the Atlantic side in the proportion of 28 or 29 to 42½. That would be approximately 50 per cent more for the Atlantic locks.

Senator KITTREDGE. In other words, if you have two locks with an aggregate lift of 85 feet, you would require 50 per cent more water than for three locks?

Mr. NOBLE. On that side—on the Atlantic slope.

Senator KITTREDGE. That is what I mean.

Mr. NOBLE. Yes, sir.

Senator KITTREDGE. Three locks, according to the plan proposed by the minority—

Mr. NOBLE. For lockage purposes only, you understand.

Senator KITTREDGE. I understand. That is what I was talking about.

Mr. NOBLE. Not the water supply.

Senator KITTREDGE. Well, the supply for lockage purposes?

Mr. NOBLE. Yes, sir.

Senator KITTREDGE. That is right?

Mr. NOBLE. Yes, sir.

Senator KITTREDGE. Was the question of water supply considered by the minority?

Mr. NOBLE. Yes, sir.

Senator KITTREDGE. You determined it to be ample for the lockage of three locks?

Mr. NOBLE. Yes, sir.

Senator KITTREDGE. Is there any doubt about its being sufficient where you increase the necessity for water as you would if the locks were increased from 30 to 42½ feet?

Mr. NOBLE. It would be necessary to provide an additional water supply a little earlier than it would under the three-lock plan.

Senator HOPKINS. What do you mean by a little earlier?

Mr. NOBLE. With the three-lock plan the water supply—my numbers may not be correct—but the water supply was adequate, we will say, for 25 passages per day; if we had to use more water for lockage purposes, it would not be available for quite so many, and when traffic developed up to that extent we would have to develop an additional water supply somewhere on the upper Chagres.

Senator HOPKINS. An additional water supply?

Mr. NOBLE. We would have to impound some water somewhere on the upper Chagres.

Senator HOPKINS. Is there any trouble about that?

Mr. NOBLE. No, sir.

Senator HOPKINS. No practical trouble would be experienced on that account, then?

Mr. NOBLE. No, sir; there would only be the cost of building a dam.

Senator KITTREDGE. Whereabouts had you in mind to build that structure?

Mr. NOBLE. At Alhajuela.

Senator KITTREDGE. How far is that from Gamboa?

Mr. NOBLE. About 10 or 12 miles.

Senator KITTREDGE. And what are the opportunities for the construction of a dam in that vicinity?

Mr. NOBLE. There is an excellent site at Alhajuela.

Senator KITTREDGE. And the dimensions are what?

Mr. NOBLE. I would have to go to the old profile for that. It was the old site selected by the French Panama Canal Company and studied by the Isthmian Canal Commission. I have examined the site. It is a rocky gorge, with rock in sight in most places on the sides of the gorge, and at no great depth in the valley, as determined by the French borings.

Senator KITTREDGE. The borings and the record of them at the Gatun dam site disclose the presence of water at different depths, do they not?

Mr. NOBLE. I believe so; yes, sir.

Senator KITTREDGE. I wish you would look on plate 12 and point out in what manner they are indicated.

Mr. NOBLE. I am not sure that they are indicated, Senator.

General DAVIS. Let me help you.

Senator KITTREDGE. That is not plate 12 there.

General DAVIS. Not that plate. This is plate 12, where they should be shown. The points where the water emerges have been omitted from this sheet.

Mr. NOBLE. It does not appear to be shown on the plate.

Senator KITTREDGE. Those were the maps sent us, as you understand?

Mr. NOBLE. Yes.

Senator KITTREDGE. Can you account for the fact that they are not shown on that?

Mr. NOBLE. No; I am not familiar with the manner in which these drawings were made up.

General DAVIS. Here is the original [indicating].

Mr. NOBLE. No, sir; I can not explain that.

Senator KITTREDGE. I return again to your testimony—

Senator HOPKINS. Before you leave that, Senator, may I ask a question?

Senator KITTREDGE. Certainly.

Senator HOPKINS. You have the original map before you, have you?

Mr. NOBLE. I am not perfectly sure about this. Perhaps I should state to the committee what I stated to the Senator a short time ago, that the work to be done by the minority in preparing their report involved so much detail that we were obliged to divide up our work, and this part of the work was attended to by one of the other members.

Senator KITTREDGE. Who did this work?

Mr. NOBLE. I am not sure. I think Mr. Stearns did, probably, who will be here to-morrow.

Senator HOPKINS. Would the fact that the profile shows water there in those different borings change the opinion that you have given as a member of the minority, and would it change the opinion that you have expressed here to-day regarding the feasibility of the dam and locks at Gatun and the construction of a lock-level canal, as proposed by the minority?

Mr. NOBLE. Not at all.

Senator KITTREDGE. In that connection, Mr. Noble, I read from your testimony given before this committee four or five years ago. Speaking of the foundation at Bohio—

Senator HOPKINS. Have you questioned him all you are going to on Gatun and those locks?

Senator KITTREDGE. No.

Senator HOPKINS. All right. I thought we had better keep that testimony together, to develop it. If you are coming back to it it is all right.

Senator KITTREDGE. I had it in mind to come back to it.

Senator HOPKINS. All right.

Senator KITTREDGE. When I referred to this subject this morning I had read you your answer in reference to the Bohio dam (reading):

"I should not consider it to possess the requisite amount of certainty as a protection for that navigation. I could not say that it would give way, and I could not predict with certainty that the seepage would be very serious, but I should apprehend it.

"The CHAIRMAN. You would not advise the building of a dam upon such a foundation?

"Mr. NOBLE. No, sir."

Do you entertain that opinion to-day?

Mr. NOBLE. The situation here at Gatun is more favorable than it is at Bohio, in the first place. In the second place, in the interval of four or five years I have changed my opinion somewhat as to the advisability of building a dam of earth, if it is made of great dimensions. I think that the amount of seepage depends upon the distance the water has to travel, and for such a great distance as proposed for the Gatun dam that that would be insignificant.

Senator KITTREDGE. On account of the weight?

Mr. NOBLE. On account not only of the weight, but of the distance through which the water would have to travel. To go into the matter a little further, the amount of water which will pass through permeable material is dependent upon two factors—first, upon the head of water exerting pressure, and, second, upon the distance which the water has to move exerting resistance. And in this case that ratio is so small that the amount of seepage would be very small.

Senator KITTREDGE. This testimony was given before this committee four years ago last month, and at that time you had just completed or practically completed your service as a member of the Isthmian Canal Commission, and had visited the Isthmus and carefully studied all the conditions relating to this route. That is right, is it?

Mr. NOBLE. That is true.

Senator KITTREDGE. What studies have you given this subject since that time until you became a member of the Board of Consulting Engineers?

Mr. NOBLE. More, perhaps, since becoming a member of the Board of Consulting Engineers than before. Still, I have during that four years read and studied to quite an extent, and have heard discussions by others of the possible amount of seepage, the thought being to determine by experiment the amount of water that would go through a given mass of material. That has been in the way of definite information from which my opinion has been changed somewhat.

Senator KITTREDGE. To what extent has your opinion changed?

Mr. NOBLE. To the extent that I should think that a dam at Gatun on that foundation would be an adequate dam for the purposes of the

Panama Canal. Such calculations as I have made and as Mr. Stearns has made, who has given this matter more attention, perhaps, than anybody else in this country, show very clearly, I think, that the seepage would be negligible.

Senator KITTREDGE. Do you consider that the danger of water running under the dam from seepage is the only danger to which it would be subjected?

Mr. NOBLE. With a dam of that magnitude I do not think it is a danger; but I do not think the dam can be moved out of its place by this water pressure. I do not think it can be washed down. I think it is safer against earthquakes than anything else that could be put there; and the only other danger that I think of for the moment is the danger of seepage underneath, which I think is absolutely negligible. As far as the danger is concerned, I can not conceive that there is any. The calculations based upon the experiments on filtration would seem to indicate that the velocity there would only be a few feet a day.

Senator KITTREDGE. Is the filtration comparison a fair one with reference to a structure of this sort?

Mr. NOBLE. I should think that, with some allowance, it will give very reliable results.

Senator KITTREDGE. What allowance? You say, "With some allowance."

Mr. NOBLE. An allowance very much within the range of possible damage to the Gatun dam.

Senator KITTREDGE. Describe how you make your experiments with your filtration plant. Is not that all carefully placed?

Mr. NOBLE. I can give you results of some old experiments.

Senator KITTREDGE. You do not quite understand me, I think. I am quite willing to have you explain as much as you please, but what I am getting at is your comparison—

Senator HOPKINS. Let him answer this first. The evidence he proposes to give may be of interest in this connection.

(By request, the stenographer read the pending question of Senator Kittredge, as follows:)

"Senator KITTREDGE. Describe how you make your experiments with your filtration plant. Is not that all carefully placed?"

Mr. NOBLE. The experiment I am about to describe was made a good many years ago by some French engineers, when they took a 14-inch pipe and filled it at the bottom from 2 to 6 feet.

Senator KITTREDGE. That was placed by hand?

Mr. NOBLE. That was deposited, of course, by manual labor. There was no other way to get it in there. That experiment was repeated with sand of different degrees of fineness, some of it very coarse and some very fine.

Senator KITTREDGE. In what manner was that placed?

Mr. NOBLE. I can not say as to the precise method used, only it was put in by hand in that pipe, of course. That was subjected to heads running from 3 to 46 feet, and the amount of water passing through was very carefully determined. In a sand such as you would find in a bank you would be quite certain to have less permeability than in a carefully selected coarse sand—perhaps a washed and screened sand—and if you assume a medium sand, on the basis of these experiments, these results of d'Arcy and Dupuit, and apply to it a cross

section which would embrace the entire areas below elevation 150, which seems to be more than you are justified in assuming from the borings, the amount of water which would percolate through would be about $1\frac{1}{2}$ cubic feet per second, which is a very trifling amount in comparison with the amount of water stored in the reservoir; and the velocity of it through the sand, supposing that the water passages were one-third of the volume of the sand, would be about 5 feet in twenty-four hours. It is inconceivable, even allowing a very large margin, that that could carry out any material beneath a dam like Gatun.

Senator KITTREDGE. In your testimony four years ago you went at some length, as you may remember, into the manner of constructing the dam at Bohio, and the substance of your testimony at that time was that you would go down to solid rock; that is right?

Mr. NOBLE. I think that is right, without doubt.

Senator KITTREDGE. And you described the process by which that could be accomplished?

Mr. NOBLE. That was the plan of the Commission at the time.

Senator KITTREDGE. Did you not?

Mr. NOBLE. Yes; I presume so. I have not read my testimony recently, but I suppose that to be the case.

Senator KITTREDGE. Would you like to have me read it?

Mr. NOBLE. I accept your statement very gladly, Senator.

Senator KITTREDGE. And in that testimony you said that you would by pneumatic process go down to bed rock, which was 128 feet below the surface, and there put in your foundation construction to keep off this water. That is right, is it not?

Mr. NOBLE. I think that is undoubtedly so; yes, sir.

Senator KITTREDGE. And you have modified your views upon that subject since that time?

Mr. NOBLE. If we could put in, without going below 125 feet, a cut-off wall at Gatun, I rather think I would do it, though I think it would be a sentimental matter and rather an unnecessary one.

Senator KITTREDGE. Why would you do it, then?

Mr. NOBLE. I think most engineers would prefer a solid masonry dam—I will not say most engineers, because a good many prefer an earth dam; but my own preference would be, in a country, at least, where there are no earthquakes, a solid masonry dam and solid rock foundation, if you could choose the conditions to that end.

Senator KITTREDGE. Would you have any preference between that dam and a masonry core and an earth dam?

Mr. NOBLE. The masonry core dam is a matter the advisability of which is very much in dispute among engineers.

Senator KITTREDGE. But you would go to foundation if you could?

Mr. NOBLE. If we could reach rock by going to 128 feet, I think I would do it.

Senator KITTREDGE. At the Gatun dam site, if you could go to solid rock for your foundation of that dam, you would do so?

Mr. NOBLE. I think so; yes, sir.

Senator KITTREDGE. Why would you do it?

Mr. NOBLE. Mainly for the sentimental reason, to give to Congress and to the people a structure more in accordance, perhaps, with what they thought was right. I do believe, notwithstanding that, that the

Gatun dam will absolutely maintain the summit level of the Panama Canal with entire safety.

Senator KITTREDGE. But there are engineers who differ with you on that question?

Mr. NOBLE. Without doubt.

Senator KITTREDGE. Strongly?

Mr. NOBLE. Yes.

Senator KITTREDGE. And entirely?

Mr. NOBLE. Yes.

Senator HOPKINS. You said "entirely." I do not understand that. Mr. Parsons, who testified here yesterday, stated that that dam would answer the purpose. Do you know of any eminent engineer that differs entirely on that proposition?

Mr. NOBLE. I understand Professor Burr to do so.

Senator HOPKINS. Professor Burr?

Mr. NOBLE. Yes. It was Professor Burr's opinion that I had in mind when I made that answer.

Senator KITTREDGE. You have read his testimony?

Mr. NOBLE. Yes. I understand his testimony to be to that effect.

Senator HOPKINS. Do you know of any other eminent engineer that takes the radical view that Professor Burr does on that Gatun dam?

Mr. NOBLE. No; I do not recall any.

Senator KITTREDGE. Do you remember your testimony four years ago upon the question of the general character of conditions underlying the Chagres Valley?

Mr. NOBLE. No; I do not recall it.

Senator KITTREDGE (reading):

"Senator HANNA. I was asking you some questions with reference to the testimony furnished by Mr. Menocal. He was asked a question about the condition of the territory which would be covered by the Bohio dam, as to the permeable material. He testified as follows:

"Mr. MENOCAL. My impression is that the whole valley is permeable, more or less—the bottom of the Chagres, the flood valley.

"Senator HARRIS. You do not think it is covered by a sufficiently heavy and tight blanket—I believe that is the technical expression?

"Mr. MENOCAL. That is the proper expression. I do not believe that it is sufficiently covered in that way. The description of the valley by the Commission shows that it is composed of gravel, sand, clay, and other permeable materials mixed in various proportions.

"Senator HARRIS. The Commission's report also indicates that they recognize the existence of this permeable material.

"Mr. MENOCAL. Yes; but even this top blanket, I think, is permeable as well, in the greater part of it, if not at all points."

Did the Commission of which you were a member recognize the character of the material in the Chagres Valley as of the character indicated in this testimony that I have read?

Mr. NOBLE. Substantially so, I think, Senator. The bed of the Chagres from Bohio up is usually sand and gravel. There is a great deal of gravelly material in it, and the banks are usually of clay, and in a good many cases the clay is underlaid by some ancient bed of the Chagres. And you will find, on going through the clay, gravel below it. Those opinions expressed four or five years ago relate to the Chagres from Bohio up, where it was in sight and

where that was in question. In the immediate vicinity of Bohio we had found that, in one or two places at any rate, the borings, instead of passing through a top clay as they did in most places, which would be considered a blanket, went into the gravel without any intervening clay; that is, the gravel was in communication with the Chagres River at no very great distance. I think that should be understood as relating to the river in the neighborhood of Bohio and from there upstream. The Gatun section was not then under consideration, as nobody thought of building a dam there.

Senator KITTREDGE. Where does the water passing at the bottom of the Chagres River at Bohio pass with reference to the dam at Gatun?

Mr. NOBLE. The water in the underlying material?

Senator KITTREDGE. Where you strike the water after making borings at Bohio, where does it go to?

Mr. NOBLE. Oh, I do not know.

Senator KITTREDGE. Does it come out into the river before you reach Gatun?

Mr. NOBLE. I do not think anybody can say.

Senator KITTREDGE. And you do not know the conditions under the Gatun site, below the indurated clay, do you?

Mr. NOBLE. Certainly not.

Senator KITTREDGE. Is there anything by which we can determine the character of the material through which that water passes, if it does pass between the indurated clay and the rock?

Mr. NOBLE. I do not think there is the least ground to assume that there is any gravel between the clay and the rock, or that there is any water present in the indurated clay.

Senator KITTREDGE. Can you say that there is not any?

Mr. NOBLE. No; I think there is no ground for assuming that.

Senator KITTREDGE. Can you say that there is not?

Mr. NOBLE. Certainly not.

Senator KITTREDGE. You answered the question upon this subject four years ago—

Senator HOPKINS. Before you go on, where he says there is no ground for assuming that, I wish he would give his reasons.

Senator KITTREDGE. Certainly, if you desire.

Senator HOPKINS. You stated, Mr. Noble, in answering Senator Kittredge's question, that there was no ground for assuming that there was any water, or whatever it was, below there. Give your reasons.

Mr. NOBLE. It would be, to my mind, such an improbable case that it would require pretty strong evidence in the way of facts to demonstrate it.

Senator HOPKINS. I did not mean to interrupt you, Senator, but I thought he had better give his reasons.

Senator KITTREDGE. That is all right.

In answer to the questions of Senator Hanna regarding the character of the sand and gravel you said [reading]:

"If that soil extended down to bed rock, an earth dam would accomplish the entire purpose of maintaining the level of Lake Bohio, but the clay is underlaid by sand and gravel, the exact coarseness of which we do not know."

Why was it impossible for you to determine that?

Mr. NOBLE. It was very difficult to determine that, with any degree of certainty, by boring, Senator. You take borings, for example, with a 2½-inch pipe, and put a smaller pipe inside to wash out the material, and you collect samples of the sand and gravel and dirt and so on as it comes out; but there may be coarser material down there that would not go up in the opening between the two pipes, or possibly material that would not go up in the larger pipe; so that it is impossible, without seeing the material actually on a larger scale than in that way, to determine precisely what it is.

Senator KITTREDGE. Was that done at Gatun?

Mr. NOBLE. No, sir.

Senator KITTREDGE. How can you tell us, then, the character of the sand and gravel that is known and conceded to be under that foundation?

Mr. NOBLE. There may be coarser gravel than has been shown by the samples. There can be no question about that. The existence of a percentage of coarse gravel, or gravel of any size, would not necessarily increase the permeability of that material. It may, in fact, decrease it. If you have a mixed material, coarse and fine, it is less permeable by far than a material of much less average coarseness all of one size.

Senator KITTREDGE. Can you tell us that it would?

Mr. NOBLE. Yes; I think that Mr. Stearns will give details of that to-morrow.

Senator KITTREDGE. Can you tell us?

Mr. NOBLE. No; I have not made the experiments, Senator.

Senator KITTREDGE. There is no question but that sand and gravel and decayed timber and all sorts of material are to be found under this location of the Gatun dam site. That is right, is it not?

Mr. NOBLE. The borings indicate that, without any doubt. The existence of decayed timber is not very disturbing, because that would indicate that there was no very strong current at the time that was dropped there. That would be, as far as it went, an indication that the current was in a condition to drop fine material rather than to carry it away.

Senator HOPKINS. To go back to the Gatun dam and the locks there: Have you, during the lunch hour, investigated the maps and drawings of the Commission, so that you can state with any clearness or definiteness as to whether, by changing the location of those locks, you can have a three-lock system, as is proposed in this plan recommended to Congress?

Mr. NOBLE. The topography there is not in sufficient detail to lay out on the map a site for three locks, and there are no borings elsewhere. Both of those are necessary to give a positive answer to that. The borings at Gatun have been extended for a sufficient distance to cover a site for two locks, but not enough to cover a site for three.

Senator HOPKINS. Two locks of what dimensions?

Mr. NOBLE. Nine hundred feet usable length.

Senator HOPKINS. If the two-lock system should be adopted instead of the three-lock system, as recommended by the committee, that would necessitate a higher lift than was proposed in the three-lock system?

Mr. NOBLE. If the entire lift were made at Gatun.

Senator HOPKINS. Yes. Well, what other suggestion have you made in that direction?

Mr. NOBLE. The plan of having a lift of two locks at Gatun of about 30 feet each—and I shall ask General Davis to correct me if I am wrong about this—and a final lift at Bohio, as advocated by General Abbott. The matter has been under some discussion.

Senator HOPKINS. That plan is entirely feasible, too, is it?

Mr. NOBLE. Oh, yes.

Senator HOPKINS. Something was said before lunch about a lift of 42½ feet if the entire lift of 85 feet is to be at the Gatun dam. Is there anything in that that would be dangerous?

Mr. NOBLE. I think not. The lock construction and the gate construction is just as safe as for any other lift, provided they are properly designed. If it should occur that a boat should drive through the head of the lock I do not think there would be very much left of it on a lift of 30 feet, but one of 40 feet, of course, would be more severe.

Senator HOPKINS. Something was said by one of the witnesses with reference to the danger of a lock canal to vessels in going in and out of the locks. Have you had any experience or observation that will enable you to give us any news as to the character of that danger and the extent of it?

Mr. NOBLE. I was at the St. Marys Falls Canal for about twelve years in local charge of the work of improvement there. During the last year I was the superintendent of the canal for operation, also. I observed closely all that was going on during the entire twelve years, and there was never any serious accident at the gates or to the lock in any way caused by the movement of vessels.

Senator HOPKINS. Well, do you, from your experience, regard the construction of a two or three lock system at Gatun as being at all dangerous to navigation?

Mr. NOBLE. I think the danger is inappreciable. I base that upon the experience had at the Soo for more than fifty years, where no serious injury has ever been done to a ship at the lock.

Senator HOPKINS. The witness who was here yesterday, Mr. Parsons, I think spoke about some accidents at Manchester.

Senator DRYDEN. When the lock was absolutely crushed down, broken down.

Senator HOPKINS. Under what conditions could such an accident as that occur?

Mr. NOBLE. The locks at Manchester are not provided with suitable approach walls, and vessels are not under control by lines until they get to the lock itself. That is my recollection of all the locks, and I have examined the drawings of the Manchester Canal since this discussion was commenced, and they conform to that. At the St. Marys Falls Canal there are long vertical walls leading to every lock, and at the upstream end those walls are more than a mile in length and at the downstream end perhaps they are 2,000 feet in length.

Vessels come to a stop, or at least come to a very slow movement, and before they are allowed to approach the locks they are required to have out a number of lines which lock tenders carry from snubbing post to snubbing post, ready to put them on at any time. Those facilities and those approach walls are very essential for the

safe navigation of a canal. I do not believe that if they had had them provided at Manchester those accidents would have occurred.

At the Kiel Canal they have a floating platform attached to mooring piles that is very much inferior to an approach wall. If a vessel touches them and then heels over a bit they are apt to roll over. They have that same appliance at the Canadian canal, Sault Ste. Marie, where, for the whole length of the canal itself, not immediately at the locks, the rock is left somewhat rough; and in order to protect vessels they have a timber fender alongside which now and then gets rolled over.

I think with suitable approach walls so that vessels can be brought under control or stopped if necessary or thought advisable, before they get to a lock, the dangers are rendered very small indeed. Then, by the provision of the additional gates, which the minority report suggests, so that there will always be two pairs closed against an approaching ship from the upper level, there does not seem to be enough risk left for the liveliest imagination to make anything out of. That seems to be so absolutely demonstrated by the fifty years' experience at the Soo that I hardly see how it could be questioned.

Senator HOPKINS. Then you attribute this damage at Manchester to the fact that the locks were not up to date?

Mr. NOBLE. I think so. The locks themselves are fine pieces of mechanism. In all the European canals that I have seen the masonry and the lock machinery are very, very fine; but they seem to have that fatal defect.

Senator HOPKINS. Yes. So that in making the recommendation that was made by the minority for the three-lock system here the engineers who joined in that took into consideration all of the elements of danger that could be imagined in the construction of a canal of that kind?

Mr. NOBLE. Yes, sir; all the elements of danger that had been suggested by the various members of the board were given very careful attention.

Senator HOPKINS. And in the judgment of the men who joined in the minority report it was so infinitesimal in character that they did not regard it as of any consequence?

Mr. NOBLE. Yes. That opinion is expressed very clearly, I think, in the minority report, in which we all agreed without any qualification.

Senator HOPKINS. Now, I wish, Mr. Noble, that you would go on in your own way and give the points of superiority of the plan suggested by the minority over the sea-level canal.

Mr. NOBLE. The reason why the minority believe the lock canal to be superior to the sea level are given at the beginning of the minority report, substantially.

The first one was that the lock canal would have a greater capacity for traffic than that afforded by the narrow waterways proposed by the Board.

The ground for that is indicated by the calculated time required for transit across the Isthmus, on page 86 of the report, which shows a very rapid increase in time required to pass as the traffic increases; and we believe that before a great while after the completion of the canal—at any rate, before the traffic becomes very heavy—there

would be at the Isthmus, as there is everywhere in the United States in narrow channels, a strong demand for the widening. That is the universal experience in every waterway, I think, in the United States. That feature of it is given somewhat in detail in one of the appendixes, where the successive stages of increasing the width and channels of the Great Lakes is dealt with.

The next reason was that we believed that the ships would pass through the lock canal with less danger to themselves and less danger of interrupting traffic. While recognizing that the locks themselves were a feature that we would gladly dispense with if other things were equal, the advantages of the broad navigation seemed to greatly outweigh the disadvantages attending the use of locks. The broader channels could not be interrupted by the sinking of a single boat, because there was so much room there, and there would be less danger of a ship colliding with the sides.

The sea-level canal has quite a length between Bohio and Obispo of narrow channel with rock not reaching to the top of the water, but still submerged; and I regard that, as the minority regarded it, as the most dangerous kind of a channel for a ship to traverse. If the vertical walls could be extended to the water line, it would be quite a different matter.

Senator HOPKINS. Just explain that fully, so that a layman may understand it without much reasoning on his own part.

Mr. NOBLE. A large vessel does not have a great deal of leeway on either side in a channel 200 feet wide. It will try to follow the center line very closely, but if by any want of judgment in steering or by the effect of a cross-wind or anything like that it does come in contact with the sides, in such a case as that the sharp rock strikes the boat in its weakest point—under water—which would almost inevitably cut a hole in the hull. At Suez they have a rock section, and they do not allow any meetings of any kind in that section. They regard it as their least safe section.

In the old days at Sault Ste. Marie, in the canal constructed by the State, the cutting was partly in rock, and near the head of the canal wholly in rock, and that was a fruitful source of injuries to ships; the bilge of the ship running upon those slopes and the hull getting into contact with those sharp points caused a great many accidents. The accidents in the canal were in the waterway and not at the locks in those days. When the improvements of the canal were taken in hand by the General Government the first improvement that the vessel interests demanded was to take out those slopes and put in vertical sides, and that was done. That work was completed in about 1874. Since that time there has been no trouble of that sort there.

Senator KITTREDGE. Under whose supervision was that work done?

Mr. NOBLE. I was the local engineer, Senator.

Senator KITTREDGE. I mean, was it done under the supervision of the State or the nation?

Mr. NOBLE. The nation.

Senator KITTREDGE. In what year?

Mr. NOBLE. In 1874. The removal of these slopes, the improvement of the work was begun by the United States in 1870; there was some deepening of the canal, but in the work done by the United

States agents the thing that they gave preference to was the taking out of the slopes.

Senator KITTREDGE. The United States Government did not take over that work until 1882, did it?

Mr. NOBLE. Not for operation. I think it was in the spring of 1881. I took over the operating when it was first turned over to the General Government. I am not quite certain as to the year.

Senator KITTREDGE. The Government did work prior to that time?

Mr. NOBLE. Oh, yes, sir; the canal was operated by the State and tolls were collected by the State during that whole time, and the expense of the improvement was paid by the General Government.

Senator DRYDEN. If these walls were vertical instead of slanting, would not that danger be obviated largely?

Mr. NOBLE. If they could be extended up to the water's surface, so that there would be no sharp corners for the hull of the boat to strike. In the Culebra cut the committee may remember that the Isthmian Canal Commission provided for a revetment wall the whole length in their estimates with that thought in view, that there must be a smooth side in the narrow channel for the safety of the ship.

Senator DRYDEN. Is it impracticable to make these walls vertical?

Mr. NOBLE. In the material there?

Senator DRYDEN. Yes.

Mr. NOBLE. It seems to be the opinion now that that is not necessary everywhere anyway, but that it would be impossible to determine how much revetment will be required to secure a smooth vertical side except as the work goes on.

Senator HOPKINS. That would be obviated in a lock-level canal?

Mr. NOBLE. In a lock-level canal there would be a narrow section of only about 4 miles instead of 19, and they intend there to have vertical walls by revetment, if necessary, extending above the water surface.

Senator HOPKINS. If we could have a sea-level canal, and follow the same caution that has been observed in the Suez Canal for a distance of 19 miles, that would not allow vessels to pass each other?

Mr. NOBLE. No, sir; I do not think that protection could be really carried out.

Senator HOPKINS. Go on with your analysis of the two schemes or types of canal.

Mr. NOBLE. The third point is the quicker passage across the Isthmus for large ships or large traffic. I went into that pretty fully this morning.

Senator HOPKINS. Then pass on to the next.

Mr. NOBLE. The fourth point was the materially less time required for construction. We believe that the period of nine years for a lock-level canal is far more conservative than the period of fifteen years for a sea-level canal, so that I think there is at least six years advantage in point of time for the lock-canal construction.

The fifth point was the materially less cost, which goes, I think, without much discussion. It amounts to somewhere in the neighborhood of \$100,000,000.

Senator DRYDEN. On the question of cost, Mr. Noble, it has been testified by one of the witnesses—Mr. Burr, I think—that the submerging of this vast extent of land would involve the Government in an enormous expense, running up to something over \$18,000,000 he

calculated, putting the price of the land at what he thought was a conservative estimate in comparison with prices at which some lands are already held. Have you given thought to that phase of it?

Mr. NOBLE. It has been rather difficult for me to conceive of the United States being held up by anybody on the Isthmus to the extent of \$18,000,000. The land is not worth it. It is worthless, or practically worthless. There is a little banana land, I believe, that has value. General Davis, I think, will confirm me that it is worth about \$50 an acre; that it costs pretty near that to develop it, and when it is ready it is, of course, worth that; but that is very small in amount, and the rest of the land that you would have to acquire is practically wild land, most of it swamp.

Senator HOPKINS. And worthless for all practical purposes?

Mr. NOBLE. Yes, sir; unoccupied.

Senator HOPKINS. Then you do not agree with the statement of the witness that it would require any such sum of money to acquire the land necessary to have a lock-level canal?

Mr. NOBLE. No, no; I do not think so.

The capacity of the locks for passing ships has been discussed here a good deal.

Senator HOPKINS. Yes.

Mr. NOBLE. The minority give the facts as ascertained at the Soo. Do you want that?

Senator HOPKINS. I should be very glad to have you develop that.

Senator KITTREDGE. I did not understand where you said the experience was taken from.

Mr. NOBLE. At the St. Marys Falls Canal. The ships passing through the St. Marys Falls Canal are of far greater average size than those passing through any other ship canal in the world, I think. The report of the minority shows that.

If I remember the figures correctly, they are about 15 or 16 times as large as the ships going through the Kiel Canal, and something like five or six times as large as those going through the Manchester Canal; so that, although there is no salt water in it, it is really a ship canal, and the experience gained there is strictly pertinent to the Panama Canal. There are vessels up there reaching a very considerable size. There are a good many in use now, quite a number that are more than 500 feet long and upward of 50 feet beam. And there are some being built this winter 600 feet long by 60 feet or a little more beam.

Senator HOPKINS. That is longer than any vessel that goes through the Suez Canal, is it not?

Mr. NOBLE. I think it is. I am not perfectly certain.

Senator HOPKINS. I think you said 550 feet, General?

General DAVIS. I have not those figures with me to-day, but the longest of those ships that I gave you a memorandum respecting the other day I think was about 500 feet—the battle ships.

Mr. NOBLE. The traffic passed through the Poe lock for some months last year at the Sault Ste. Marie, a single lock 800 feet by 100 feet, was at the rate of 40,000,000 tons a year. That is through one lock. At Panama you have two locks, and instead of eight months' navigation you have twelve months, although you can reduce that a little bit for short periods for repairs, if you will. The estimate that we give of 80,000,000 tons seems to be absolutely justified by the facts.

We found that the amount of traffic that a lock will pass depends very largely upon the size of the lock.

The Wetzel lock, for example, the one second in size at the Sault Ste. Marie, passed in 1895, when it was hard pushed—it was the only lock during the greater part of the year that was available for vessels—about 15,500,000 registered tons; and the Poe lock in 1905, a larger lock, without being pushed at all, passed 24,000,000 registered tons. So that its capacity is certainly 60 per cent more than the Wetzel lock, and probably very nearly double. Now, the locks at Panama, 900 feet by 95 feet, are larger in area, and the draft of ships passing through will certainly exceed the maximum of 19 feet and some inches through the Soo; and that will all tend to increase the traffic capacity of the locks. I can not doubt for a moment that the estimate of 80,000,000 tons per year for a duplicate system of locks is moderate.

Senator KITTREDGE. What was the tonnage passing the Soo last year? We have discussed that question.

Mr. NOBLE. I do not think I have it here, but it is approximately 36,000,000 registered tons and, I think, about 45,000,000 tons of freight.

Senator KITTREDGE. Last year?

Mr. NOBLE. Yes. That is subject to correction, Senator. That is my best recollection. I have not the exact figures with me.

Senator KITTREDGE. It varied, as I recollect, from 36,000,000 to 40,000,000 tons—

Mr. NOBLE. I think it is about 45,000,000 tons freight.

Senator HOPKINS. What is the time required to pass the lock here at the Soo?

Mr. NOBLE. The time given in the records at the Soo includes the time to pass through the canal itself. The extreme length is about $1\frac{1}{2}$ miles. The average for last year was one hour and thirty-nine minutes. That time is made up of several elements; one of them, of course, is the time for lockage, and the lockages at the Soo were mostly fleet lockages, so that the first boat, after entering the lock, has to wait until the second one can be placed, which tends to increase the time for the first vessel at least. Then, all the time necessary to navigate the canal also is included. In the month of December the entire period was fifty-five minutes. In the month of April it was two hours and fifty-nine minutes. Why those differences occur I can not say.

Senator HOPKINS. Take a fleet of six ships here at the Gatun locks, and how long, in your opinion, would it take those six ships, say, 500 feet in length, to pass through the locks, supposing that they came up about the same time and were anxious to get through the locks?

Mr. NOBLE. If I remember rightly, we figured the interval between ships as something like fifty minutes. That was up here the other day. Then, we made an allowance for delays of all kinds, such as based upon the Soo Canal experience, of approximately 50 per cent. That would give about seventy-five minutes.

Senator DRYDEN. This morning, in answer to a question, Mr. Noble, I understood you to say that as to the speed of getting through the lock canal, the capacity of the canal was the capacity of the locks. That would be true only in a restricted sense, would it not? That is

to say, just as soon as a boat was through the locks, then it would speed away at a rapid rate of speed and overcome any loss of time after it got through the locks? The delay, in other words, would only be regulated by the time it took the boat to get through the locks, would it not?

Mr. NOBLE. I did not understand the question to cover that. What I understood you to mean was the maximum number of ships that could pass through the lock canal in a given period, say a week or a month or whatever it might be. That would be limited by the number of boats that could be gotten through the locks, because as soon as they would pass through the locks they would go through the intervening waters very quickly. In fact, the capacity would be regulated practically by the first lock they came to. That would certainly be the case if there were duplicate or triplicate locks, because the first lock encountered would space the boats, and they would go right along and find the next lock awaiting them without any appreciable further delay.

Senator DRYDEN. But in comparing the relative time in which the boat could get through a lock canal with that in which it could get through a sea-level canal, the speed attained in the lock canal would not be regulated by the locks any further than the time it took to go through the locks?

Mr. NOBLE. No; not at all.

Senator DRYDEN. No. I wanted that made right on the record, as I thought possibly it might be misunderstood by anyone reading the record.

Senator KITTREDGE. I suppose, in speaking of the capacity of the canal being limited by the capacity of the locks, you meant the tonnage?

Mr. NOBLE. The tonnage capacity in a given time; yes.

Senator KITTREDGE. I assumed that that was it.

Mr. NOBLE. That was the thought I had in mind.

Senator KITTREDGE. In other words, you can not pass through the canal any more tonnage than you can get through the locks?

Mr. NOBLE. Precisely; because you can not get to the higher levels of the canal.

Senator KITTREDGE. That is the proposition, of course.

Senator DRYDEN. When you designed these locks and provided for a usable space of 900 feet, you assumed that there was to be but one set of gates at each end of the locks, I suppose. That was your assumption—that there would be but one set of gates?

Mr. NOBLE. Yes.

Senator DRYDEN. It seems that the reduction in the usable lengths of those locks has been brought about by the provision for a second set of gates at each end. You so understand that, do you, Mr. Noble?

Mr. NOBLE. No; I thought that the point raised this morning was due to a draftsman's mistake.

Senator DRYDEN. No; it was testified yesterday by Mr. Parsons that the reduction in the usable length of the locks was brought about in that way—by a subsequent conclusion of the minority that it was a matter of safety and was a protection which they thought necessary to put up, to establish another set of gates at each end of the lock, so, as I understand it as a layman, that if there should be an accident,

a boat coming up against the gates and smashing one set of gates would still have another set of gates to protect it.

Mr. NOBLE. I think I see your point now, Senator. With a ship 900 feet long coming down stream in the summit level, the lock gates and safety gates at the lower end of the upper lock being closed in front of it, its stern would not clear the upper-lock gates; but the safety gates just beyond them would be closed. The safety gates at the lower end of the lock would be opened, the summit level after this operation being still protected by two pairs of gates, viz, the safety gates at the head of the upper lock and the lock gates at the foot of the same. The ships would then be moved toward the lower-lock gate until the available distance was taken up, and then the lock gates at the upper end of the lock would be closed. The operation of locking down through the flight of locks would then be continued in the ordinary way. In the operation just outlined, the summit level would always be protected by at least two pairs of gates and the lock would have a usable length of 900 feet under all circumstances.

Senator DRYDEN. Have you given any thought to the question of how we would protect or defend this canal in time of war?

Mr. NOBLE. No, sir; I have not looked at the military situation at all.

Senator DRYDEN. But the question has arisen as to whether these locks could not be attacked with great ease, even under the most thorough guarding on the part of the Government.

Mr. Parsons stated that a single man could carry enough dynamite to those locks or into those locks, and might do it on a merchantman, for instance, and carry this dynamite in sufficient quantities to blow the locks all to pieces and destroy them.

Mr. NOBLE. The amount of that danger, I think is indicated by the fact that in the history of canal navigation that thing has never been done. It is a conceivable possibility, but we have to consider the probabilities in a matter of that sort.

Senator DRYDEN. Of course the point came up in connection with whether the lock system could be much more easily destroyed than the sea-level system.

Mr. NOBLE. Yes. The minority thought that the difference in risk of the stoppage of navigation as between the two systems was not very much. A single vessel would block the sea-level canal to a certainty, and it probably would not block the channel of the lock canal, while the locks themselves are the points which certainly would be most carefully and could be most easily guarded. It would be almost impossible to guard every foot of the sea-level canal across the Isthmus. There are a good many points where it touches on the jungle; but the locks are the places where defense would be readily provided and would be most thoroughly done.

Senator DRYDEN. The statement made by Mr. Parsons yesterday was to me startling as to the possibility of these locks being destroyed. You have already touched upon that, and I do not know that you want to say anything more; but he made the statement that, in his judgment, as I remember it, there was not any question about the danger or liability of these locks being utterly destroyed, broken down, crushed, so that it would take from three to five years to restore them.

Mr. NOBLE. It seems inconceivable that the locks would be destroyed. A gate might be disabled without using a very large quantity of dynamite; but to destroy the lock you would have to have something like a steamboat loaded with it. That is all conceivable, but practically I do not think it amounts to anything.

Senator DRYDEN. You refer to the gates?

Mr. NOBLE. Yes.

Senator DRYDEN. Which are, of course, a part of the locks?

Mr. NOBLE. Yes.

Senator DRYDEN. This statement of Mr. Parsons applies to destruction caused by large steamers meeting with an accident there, as well as by dynamite.

Mr. NOBLE. Oh, yes. Well, do you mean doing it maliciously?

Senator DRYDEN. Oh, no; not in the case of the steamers; that being a pure accident.

Mr. NOBLE. Oh, yes.

Senator DRYDEN. The question was asked, I think by myself, as to what would be likely to become of the boat that should meet with such an accident there, and in general his reply was that probably the fragments would be found out in the Caribbean Sea.

Mr. NOBLE. Well, in the Manchester Canal I believe the boats stopped in the lock; but these lifts are higher, and I should think it quite possible that they would go right along. I think that the danger is small. It has not occurred for fifty years at the Soo, although a boat ran into the lower gate of the Poe lock—I think that occurred twice—without stopping the navigation very much. At the Poe lock they have two pairs of gates at the lower end of the lock; and on one of those occasions they simply used the next pair for the remainder of the season. They did not stop to repair the first pair.

Senator DRYDEN. Have you found that the mechanism in use in these locks is so simple and so strong that it does not get out of order, so that it is safe from the objection of liability of getting out of order?

Mr. NOBLE. As to the machinery for the Wetzel lock I do not think that was ever out of order for a quarter of a day a year during the season of navigation. There are little things that occur in the operation of a lock—a rope fender may get between the gate and the sill and we would have to stop and open the gate and fish it out; or a piece of driftwood may get in there. Those things occur sometimes, but they do not count much in the aggregate.

At Liverpool they have machinery somewhat like that we have at the Soo or at the Wetzell lock. Perhaps I should reverse that statement and say that ours is similar to theirs; and they work very safely, without trouble.

In the Poe lock at the Soo, the last one built, the machinery gave considerable trouble for two years, until it was overhauled and rebuilt. That runs along very smoothly now. That was on quite a different plan from the other. So that the best type of machinery in use for operating lock gates does not give trouble. It is very simple and reliable.

Senator HOPKINS. After a vessel gets in the lock, there is not very much danger of that vessel running up against the gate and knocking the gate out, is there?

Mr. NOBLE. We have had fifty years of immunity from that at the Soo, Senator.

Senator HOPKINS. In the construction of the Gatun lock, the system of construction, in your judgment, would be as safe as the one at the Soo?

Mr. NOBLE. It is safer, because we have these additional safety gates at both ends of the summit lock. That is the only place where any serious trouble could occur, and provisions are made in this plan here unprecedented in point of avoiding danger.

Senator HOPKINS. I think that is all.

Senator TALIAFERRO. Were these safety gates you speak of provided for in the original plan of the minority, Mr. Noble?

Mr. NOBLE. Yes, sir.

Senator TALIAFERRO. Is the plan as proposed by the minority one that could be recommended by this committee without modification or change?

Mr. NOBLE. Unquestionably, I think.

Senator TALIAFERRO. There is no change necessary at the locks on the Atlantic side?

Mr. NOBLE. I think not. I think you must leave a little leeway to the constructing engineers to make such minor changes as may be necessary as the work goes on—the revetment of the Culebra cut, and all that—and possibly this alternative between two locks and three at Gatun, although I have not the slightest doubt that they can get a satisfactory site for three locks at Gatun.

I am far from apprehending that we have not got a suitable place now, only they may have to move the locks a little farther down stream; but, as I suggested before, that is not proven by the borings. A little supervision of changes in location ought to be left to the judgment of the constructing people.

Senator TALIAFERRO. So that you consider that this flight of three locks could be put in now as proposed by the minority?

Mr. NOBLE. I believe so, if you will only leave a little leeway as to the location, Senator.

Senator TALIAFERRO. Mr. Noble, if it had transpired that the sea-level canal could have been built for the amount of money and within the time that the lock canal could be built, would you have joined in the minority report for a lock canal?

Mr. NOBLE. I do not know. I should want to think that over pretty carefully. A broad sea-level canal, say, 500 feet wide—I say 500 feet wide for illustration—of course would be preferable, in my opinion, to any lock canal; but it would be so enormously costly that I doubt if the committee would consider it seriously. If you could build a sea-level canal for the same money, the greater facility it offers for indefinite widening and for ultimately becoming what our friend, Bunau-Varilla, calls the Straits of Panama, would be quite a strong feature in its favor.

Senator TALIAFERRO. Could this sea-level canal, as proposed by the Board of Consulting Engineers, be widened as necessary without very serious cost?

Mr. NOBLE. The sea-level canal?

Senator TALIAFERRO. Yes.

Mr. NOBLE. It would cost a good deal of money to widen that. The

report of the minority contains a figure, which I do not recall now, giving that.

Senator TALIAFERRO. Could it not be widened without very serious cost at all points except through this rock cutting in the Culebra cut?

Mr. NOBLE. It would be a matter of relatively inexpensive dredging until you got to the rock sections. The rock sections extend a pretty large part of the way from Bohio to the Pacific. It is a long distance.

Senator TALIAFERRO. Eliminating, then, the difference in cost and the time of construction, you are not prepared to state whether you would prefer the lock canal or the sea-level canal as proposed by the Board?

Mr. NOBLE. I would not be prepared to give a definite opinion on that without careful study. The premises themselves are inconceivable, I think, if I may be permitted to say so, and the matter has never presented itself to my mind before.

Senator TALIAFERRO. I ask the question, Mr. Noble, because I wanted to ascertain how much stress you put upon the difference in cost and the difference in time in selecting and reporting in favor of this high-level canal rather than in favor of the sea-level canal.

Mr. NOBLE. I should not consider the sea-level canal, as it is now proposed to be built, to be as good as the lock canal as now proposed to be built, but the possibilities of future enlargement—and, on the premises you were proposing, it would then become, of course, economical enlargement—would be a very attractive feature of that project.

Senator TALIAFERRO. Have you ever considered the possibilities of converting this lock canal into a sea-level canal later on?

Mr. NOBLE. Oh, yes, sir.

Senator TALIAFERRO. Do you agree in the estimate of cost of \$280,000,000 to do that work?

Mr. NOBLE. I agree in that if the work of transformation is to be done in the near future. I should rather expect, if it should be deferred for a long time, that processes would be developed that would result in more economical transformation. But as the matter was presented to us, obviously for immediate transformation, I think that the Board were unanimous on the subject, with possibly one exception, that the estimate would be correct—that the prices used were about as low as it was safe to present.

Senator TALIAFERRO. You agreed with the Board in the estimate of cost of the sea-level canal?

Mr. NOBLE. Oh, substantially; yes.

Senator TALIAFERRO. The material difference between you was as to the time necessary to construct the sea-level canal?

Mr. NOBLE. Yes.

Senator TALIAFERRO. Do you regard, other things being equal, the sea-level canal as the ideal canal?

Mr. NOBLE. If you make it as broad as the lock canal, certainly; if you make it as broad and do it as cheaply.

Senator TALIAFERRO. You consider the principle of the sea-level canal the ideal principle for canal building?

Mr. NOBLE. Oh, certainly. I think that locks themselves are objectionable, other things being equal.

Senator TALIAFERRO. I have no further questions.

Senator HOPKINS. I understand you to say, Mr. Noble, that taking the sea-level canal as proposed by the majority and the lock-level canal as proposed by the engineers with whom you joined, that the lock-level canal as proposed would be the better canal?

Mr. NOBLE. It would be the better canal if both were built exactly according to the designs presented to the committee.

Senator TALIAFERRO. Mr. Chairman, I did not understand the witness to make as broad a statement as that.

Senator HOPKINS. He is making the statement now.

Senator TALIAFERRO. I wish to call to the witness's attention what his statement was a moment ago—that the questions of cost and of time entered into the consideration.

Senator HOPKINS. Yes; you brought that out; but in answering I understood the witness to say—and if I did not understand him correctly he can correct me—that taking the sea-level canal as proposed by one set of engineers and the lock-level canal as proposed by the other, he would prefer the lock-level canal, regardless of time or money.

Mr. NOBLE. I think the lock-level canal as presented to this committee is a better canal than the sea-level canal as presented to this committee.

Senator HOPKINS. Yes; that was the point that I was getting at.

Senator TALIAFERRO. Mr. Noble, that is in consideration, I understand, of the reasons which you have given in that minority report?

Mr. NOBLE. Yes.

Senator TALIAFERRO. Eliminating any of those reasons that you have assigned for your preference for the lock-level canal, would it change your conclusion?

Mr. NOBLE. What, for example, may I ask?

Senator TALIAFERRO. The time and cost.

Mr. NOBLE. Certainly; I think that the lock-level canal as planned is a better canal than the sea-level canal as planned—better for the use of commerce, without regard to cost.

Senator TALIAFERRO. If they cost the same?

Mr. NOBLE. If they cost the same. I think that if we had two canals on that route, if it were possible, one built as proposed by the lock-level people and the other built as proposed by the sea-level people, the lock canal when finished would be the better one.

The CHAIRMAN. Senator Morgan has sent me word that he has no questions to ask, and that he will not be in the committee room this afternoon.

Senator TALIAFERRO. Is there any further statement you would like to make to the committee. Mr. Noble, on your own account?

Mr. NOBLE. There are one or two points that I might possibly touch on without encroaching too much on the time of the committee.

Senator HOPKINS. We will be glad to hear you.

Mr. NOBLE. One is the matter of curvature. It was stated here, I think, in one of the hearings recently, that in the lock canal the curvature was as sharp as a radius of 1,700 feet.

I wanted to point out that the line as laid down by the lock committee is a succession of broad, straight reaches, and it is connected by turns similar to those which experience has shown to be advisable at Sault Ste. Marie, on the St. Marys River; and the vessels there

ordinarily turn pretty sharply in making these changes of direction. But there is no change of direction in the lock-level plan of the Panama Canal, where, if you lay down a curved channel 200 feet wide and of 8,000 feet radius, it will not fall wholly within the limits of the channel; so that if a vessel chose to go around that curve at an 8,000-foot radius it could do so. But as a matter of fact they would not do it.

I thought possibly that was necessary to straighten out the idea as to curvature.

Now, I think that the Mill River dam was cited here a day or two ago as an example of the unsafe construction of dams; and I have been at some pains to collect some data in regard to that dam. I have here a few notes which it will not take long to present to the committee.

The Mill River dam was built in about 1865, and it failed in 1874. It was a dam 40 feet high, and it had a core wall, and the core wall was supposed to be founded in hardpan. It was such a very serious disaster, and created so much engineering interest besides, that a committee was appointed by the American Society of Civil Engineers to report upon it. That committee was composed of James B. Francis, by all odds the most eminent hydraulic engineer of his day, and Messrs. Theodore G. Ellis and William E. Worthen, both of them very distinguished engineers.

They reported that the dam as planned was to have side slopes as steep as one in one and a half; that the core wall was to be founded by digging a little trench 2 or 3 feet deep in the hardpan; that the fill was to be made in thin layers within 5 feet only of the core wall, and outside of that material was to be dumped in in 5-foot layers without being compacted.

The construction was as bad as possible. It was built without adequate inspection, and there was reason to believe that the core wall in places did not extend even down to the hardpan; that it was not properly founded.

An observer, an eye-witness of the failure, said that the first thing that occurred apparently was the sloughing off of the material on the downstream side of the core wall.

Senator KITTREDGE. Do you mean of the earth?

Mr. NOBLE. Of the earth; yes; this illy compacted material; and that it was followed shortly after by another slide, and that that left the core wall—that thin core wall that was only 5 feet thick at the base—to support that entire head of water; and it naturally fell over, and the whole thing went out in a very few minutes.

The engineers criticised the construction as being entirely improper, on account of the material not having been put in in layers and made solid; the cross section was never large enough anyway, and the core wall itself was utterly inadequate.

I thought it was desirable to present those facts to the committee as giving sufficient reason why that particular earth dam failed. There were a number of reasons why it should have failed.

I do not think of anything else that I care to present to the committee.

Senator ANKENY. This is a timber country, Mr. Noble; and does not the water carry vast amounts of timber and débris down above your dams there?

Mr. NOBLE. I do not know how much timber those rivers carry. I never have happened to see them in flood. It is a timbered country, and I should rather expect that they carry timber.

Senator ANKENY. It is apparent that they do from the deposits of timber and other matters below there.

Mr. NOBLE. Oh, that does not necessarily mean that there was a great amount carried; but I should expect them to carry it.

Senator ANKENY. Following it further, will not that debris and sediment that collects above those dams eventually make a deposit there that will, almost, in years, fill up the dam?

Mr. NOBLE. The lake itself, you know, will extend away up the Chagres, 10 or 12 miles above Gamboa.

Senator ANKENY. I have Johnstown in my mind; so you know what I am thinking of.

Mr. NOBLE. Yes. Now, the tributaries of the upper Chagres, where timber would mainly come from, I should think, would be impounded and become slack current, and that material, I think, would eventually go ashore. The winds would carry it across.

Senator ANKENY. Yes; but is not that a menace to your dam?

Mr. NOBLE. I think not. The wind there, fortunately, is almost invariably from the dam, toward the other side of the lake. The trade wind blows across there and blows from the dam into the interior. I should not expect any of it to ever reach the dam, but it might collect on the opposite shores.

Senator ANKENY. The sediment certainly will. That is what the dam is there to stop.

Mr. NOBLE. I do not think there will be much sediment in the water there, Senator. I think the sediment will be deposited long before it reaches the canal line.

Senator ANKENY. Where the current ceases?

Mr. NOBLE. Where the current ceases.

Senator ANKENY. That is all I have to ask.

The CHAIRMAN. Mr. Noble, we thank you for your presence here and will not need to trouble you further.

Mr. NOBLE. I am greatly obliged for the courtesy of the committee.

(The committee thereupon adjourned until to-morrow, Friday, March 16, 1906, at 10.30 o'clock a. m.)

ISTHMIAN CANAL.

COMMITTEE ON INTEROCEANIC CANALS,
UNITED STATES SENATE,
Washington, D. C., Friday, March 16, 1906.

The committee met at 10.30 o'clock a. m.

Present: Senators Millard (chairman), Kittredge, Dryden, Hopkins, Knox, Ankeny, Morgan, Taliaferro, and Simmons.

Present, also, Maj. Gen. George W. Davis, U. S. Army, retired.

STATEMENT OF FREDERIC P. STEARNS, ESQ.

The CHAIRMAN. Mr. Stearns, please state your full name, age, residence, and occupation.

Mr. STEARNS. Frederic P. Stearns, Boston, Mass.; age, 54; civil engineer.

The CHAIRMAN. And the position you are holding at the present time is what?

Mr. STEARNS. My regular position is chief engineer of the metropolitan water and sewerage board of Massachusetts.

The CHAIRMAN. Now, Mr. Stearns, if you will be kind enough to give us a little history of yourself, say for the past ten or fifteen years, stating the different positions you have held during that time, it will be a favor to the committee.

Mr. STEARNS. I have been engaged in engineering work for thirty-seven years. I was connected with the additional water supply of the city of Boston as a division engineer from 1872 to 1880, and there I had to do with the construction of waterworks and hydraulics, and especially of importance, possibly to you, hydraulic experiments, which were the basis of some publications on the subject before the American Society of Civil Engineers.

From 1883 to 1886 I was engaged upon the Boston main drainage works, the main sewerage system of the city of Boston, which included a large amount of heavy construction.

From 1886 until 1895 I was engineer of the Massachusetts board of health. That is practically a sanitary board in its engineering features, and I had occasion to look after the water supplies of the State of Massachusetts, and the experience there that is of especial value in connection with the Panama Canal was with reference to water supplies taken from the ground, and the filtration of sewage, the experience in both of those lines being of value as to the movement of water through the ground. I had occasion to determine the capacity of many ground-water supplies. Also, in connection with my experience there, I was engaged upon devising a system of metropolitan sewerage for Boston

and the surrounding towns, and later in devising a system of water supply for Boston and its suburbs at an estimated cost of \$24,000,000.

From 1895 up to the present time I have been the chief engineer of the metropolitan water and sewerage board, engaged in constructing the works at a cost of about \$24,000,000, and in connection with that work I have had occasion to build many dams, one of them a masonry dam that has a head from bed rock up to the water line of the reservoir of 189 feet. I also have constructed there what is known as the north dike of the Wachusett reservoir, which is similar to the Gatun dam.

While I was with the State board of health a great many experiments upon filtration of sewage were carried on, and, although not immediately under my direction, a Mr. Allen Hazen, who is now known as a distinguished engineer, chemist, and physicist, made experiments to determine the resistance of sands and earths of various kinds to the filtration of water. One of his recent engagements was as consulting engineer in charge of the water-filtration plant here for Washington. It was on the basis of the work that he did and of which he published the results that I designed the dam upon the metropolitan waterworks that is almost exactly like this proposed Gatun dam. Before constructing that dam, however, I carried on experiments myself for two years in determining the resistance of the various materials found at the site of that dam to the passage of water; that is, they were what I called filtration experiments.

Senator KITTREDGE. Which dam do you now refer to?

Mr. STEARNS. I am referring to the earth dam known as the north dike of the Wachusett reservoir, which is so similar to this Gatun dam.

Senator KITTREDGE. I wished to know whether it was this dam, the Gatun dam?

Mr. STEARNS. No. After having made all of those experiments, that north dike that I refer to was built. It is now completed, but the reservoir has not filled behind it so as to rise more than one-third of the height of the dam, so that it has not had the full test.

The CHAIRMAN. What would be the height of that dam?

Mr. STEARNS. The dam retains 65 feet of water, while the Gatun dam is to retain 85 feet.

Senator KITTREDGE. If it will not interrupt you, I would like to know the height of the water above the surface of the ground at the stone dam you have spoken of.

Mr. STEARNS. One hundred and twenty-nine feet. I think that is right. It is either 129 or 127 feet.

The CHAIRMAN. Proceed, Mr. Stearns, please.

Mr. STEARNS. In what I have said I think I have described my experience which has a special bearing upon work at the Panama Canal.

The CHAIRMAN. As I understand it, Mr. Stearns, you were appointed a member of the Commission. Was that your first connection with the Panama service, when you were made a member of the Consulting Board?

Mr. STEARNS. It was.

The CHAIRMAN. And you visited Panama last fall?

Mr. STEARNS. I did.

The CHAIRMAN. Had you ever been there before?

Mr. STEARNS. No.

The CHAIRMAN. If you will give us now a statement of your visit there in the fall, and then go on and make a statement in reference to this dam, we shall be glad to hear you.

Mr. STEARNS. I will say that before visiting Panama I had considered the subject of placing a dam at Gatun, and made drawings and presented the subject to the Board of Consulting Engineers on the basis of the borings that then existed. They seemed to be sufficient to show clearly that it was feasible to build a dam at that place. Then, as it was desirable to have more borings, I prepared a draft of a cablegram which was sent to the Isthmus, asking for additional borings directly at the site of the dam. At the time of the visit, which was at the end of September, we went to Colon, and for eight days we were examining the sites of the various works at the Isthmus.

Senator MORGAN. Is that all the time you ever spent on the Isthmus?

Mr. STEARNS. It is; and one day should be counted out from that, in part, which was Sunday, when we did not make a trip. Otherwise we put in good full days. I saw all parts of the canal. I presume it is not necessary to go into that at present.

Senator KITTREDGE. I wish you would, before you finish, Mr. Stearns, describe somewhat in detail the time that you spent on each feature of the canal.

The CHAIRMAN. I think he had better go on with the description of this first.

Senator KITTREDGE. Oh, yes; that is all right.

Mr. STEARNS. In connection with the Gatun dam, we examined the territory, found that they had a large number of men at work making borings. We talked the matter over with Mr. Maltby, the engineer in charge of that work, and saw the site of the proposed locks and of the proposed spillway and diversion channel, and also visited one part of the line of the dam where rock was exposed at the surface of the ground, and one where the French had started the diversion channel and then stopped digging on that line because they encountered the rock.

Senator KITTREDGE. That was at the west of the Chagres?

Mr. STEARNS. Yes; near the west end of this proposed dam.

Senator KITTREDGE. And west of the hill?

Mr. STEARNS. Yes; west of this central hill. It was on ground that was rising somewhat above the river and quite a long distance from the alluvial channels.

The point that I refer to is on this plan of the dam where the word "rock" is marked, near the westerly end of the dam [referring to plate 11]. Not all of the borings are shown on this plan, and, by the way, each of these black dots here represents the location of a boring. Not all of those on the line of the dam were made at the time we were there, but the information was sent afterwards.

In the engineers' office at Gatun they had the samples that had been washed up from the ground by those borings, and they showed, as far as I saw them—and I saw a great many of them—that is, very generally they showed, if not in all cases, that there was a large amount of clayey material with the material that was washed up. The borings that went down in the great depth, in the alluvial valley where the diversion channel is located, had not then been made. There, in the lower 58 feet, they found porous sand and gravel; but those had not been made at the time that we were there.

Senator KITTREDGE. That was at the extreme westerly end of the Gatun dam, was it?

Mr. STEARNS. No; not at the extreme end. It was at this point here [indicating on map]. You can see that it is quite a distance from the extreme westerly end.

Senator KITTREDGE. Is that west of the central hill?

Mr. STEARNS. Yes; this is the central hill that I have mentioned [indicating on map], and the alluvial valley between that and the hard land, rocky land, is represented by this comparatively short distance here [indicating]. This geological gorge, as it has been called in the testimony, is here [indicating on map] on this side of the central hill and again in the valley through which the canal itself passes.

Senator KITTREDGE. Will you please repeat your statement regarding the borings west of the central hill?

Mr. STEARNS. The borings west of the central hill had not been made at the time that we were at the Isthmus, and therefore I did not see the samples from those borings.

Senator KITTREDGE. What does the record since obtained show?

Mr. STEARNS. The record since obtained shows that that material was porous sand and gravel, in that lower 58 feet in this particular valley.

Senator KITTREDGE. To what depth did the borings go at that time?

Mr. STEARNS. Two hundred and fifty-eight feet is the deepest one.

Senator KITTREDGE. And substantially the same depth to the east of this central hill?

Mr. STEARNS. No, sir; to the east of the central hill I think the deepest boring was about 204 feet. That was the deepest that had been taken. Whether there was a deeper one found subsequently, I do not know.

Senator KITTREDGE. Will you not look at plate 12?

Senator TALIAFERRO. Do the borings all go down to rock?

Mr. STEARNS. Very nearly all. I think there was one that did not go down to rock, but I am not sure but what it was repeated afterwards and carried to rock.

Senator MORGAN. When you say rock do you mean real solid rock or indurated clay?

Mr. STEARNS. I mean indurated clay.

Senator MORGAN. You should call it by that name, because it is not rock.

Mr. STEARNS. It is rock, to all intents and purposes, as a foundation or for stability and standing. Now, I am referring to the indurated clay that is between Colon and Gatun; and at this point it is different from some of the other indurated clay in the Culebra Cut, which dissolves in water.

Senator MORGAN. This does not dissolve?

Mr. STEARNS. This does not dissolve, according to my information.

Senator KITTREDGE. But it washes out?

Mr. STEARNS. Not at all, I think.

Senator MORGAN. What do you mean, then, by that depression there on this blueprint—I will call it to your attention—

Mr. STEARNS. I would like to say just a word as to the reason I say it does not dissolve. Mr. Maltby told me that the French excavated a dry dock with vertical sides, and that I think must have been back in 1880 something—certainly it was the old canal company that did it—

and that that retained there its vertical sides without any trace of action by the weather upon it at all. That is not true of some of the indurated clay in the Culebra cut.

Senator MORGAN. This is the blueprint that we have been going on as being entirely correct, as to the proportions of the drawing, and also a correct statement of the actual borings that were made on the axis of this dam at Gatun. Here is a deep gulch [indicating on profile].

Mr. STEARNS. Yes.

Senator MORGAN. One hundred and how many feet below——

Mr. STEARNS. Two hundred and fifty-eight feet below mean tide.

Senator MORGAN. Yes. And here is another one [indicating on profile].

Mr. STEARNS. There is another one that is shown to be about 202 feet deep at its deepest point, below mean tide.

Senator MORGAN. And then it goes off at lower levels to the right and left on this map.

Mr. STEARNS. At higher levels.

Senator MORGAN. How did that gulch get in there if it was not washed out by water?

Mr. STEARNS. It undoubtedly was washed out, but I should like to explain and say how I understand that gulch to have been made.

Senator MORGAN. I wish you would.

Mr. STEARNS. That is, not only one of them, but both of them.

Senator KITTREDGE. Before he makes that explanation may I ask a question, Senator?

Senator MORGAN. Yes.

Senator KITTREDGE. Where is that deepest gulch with reference to the central hill?

Mr. STEARNS. It is west of the central hill and occupies the valley through which this French diversion channel runs. It extends between the points where my two fingers are touching the plan.

Senator KITTREDGE. And point out on the map where the other pocket, or whatever you call it, is, please.

Senator DRYDEN. The other gulch.

Mr. STEARNS. The other gulch extends about from the railroad to the central hill, between my two fingers, as I now have them on the plan.

Senator MORGAN. That is the one that is not quite so deep, but broader.

Mr. STEARNS. Not quite so deep, but wider, yes.

Senator KITTREDGE. How far is the railroad from the location of the locks as planned by the minority?

Mr. STEARNS. Well, it runs off at an angle, so that——

Senator KITTREDGE. About how far? I am not particular about the exact distance.

Mr. STEARNS. The greatest distance from the railroad to the locks is about 1,500 feet, and the shortest distance to the locks from right at Gatun is about 600 feet.

Senator KITTREDGE. Now, if you will answer Senator Morgan's question.

Mr. STEARNS. This is based on what I have heard stated by geologists, and what I have observed, in part.

Senator MORGAN. I wish, in making your statement, you would take into account this fact, also: The borings here show that upon this line [indicating on profile] water appeared; what is the elevation there?

Mr. STEARNS. That is about 50 feet below sea level.

Senator MORGAN. Water appeared there in the pipes that were driven down?

Mr. STEARNS. That 50 feet is not an exact statement; that is it approximately.

Senator MORGAN. And on the same level over here in the next gulch [indicating on profile] it appeared as you were driving your pipes down. Now, the conclusion that an engineer has stated here is that the water that appears here [indicating], and here [indicating] is connected by a conduit or an opening of some kind between the two, around this island. Is that your conviction?

Mr. STEARNS. Not at all.

Senator MORGAN. It is not? If you have a different explanation. I wish you would state it as you go along.

Mr. STEARNS. Let me explain, first, the formation of these gorges, as I understand it.

The CHAIRMAN. I think, gentlemen, if we will allow Mr. Stearns to go along and make his statement to the committee without interruption for a little while—

Senator MORGAN. I interrupted him to ask him to include that statement in his general statement.

The CHAIRMAN. I think we shall be better prepared to ask questions if we wait until he finishes his statement, because I think he is the authority on what he is talking about now in this country.

Mr. STEARNS. The earth, when it was formed, had no soil upon it. It was rock, and the rivers started to run down these rocky valleys, with perhaps very little depression. In the course of time they cut away a gorge, just as one sees out in the Denver and Rio Grande gorge, or in a great many other places. Water running over rock will cut a gorge down into the rock.

Senator MORGAN. You mean to say, I suppose, that the earth, when it was formed, was composed of rock and water?

Mr. STEARNS. Rock and water.

Senator MORGAN. Just those two elements?

Mr. STEARNS. Yes; I am going back a good ways. [Laughter.]

Senator MORGAN. Yes; a good ways.

Mr. STEARNS. There is nothing like starting at the beginning. The geologists speak of a comparatively new valley, that may be a million years old, perhaps, where the water has washed down and formed a gorge, but the sides have not run in enough to level themselves, and there is a steep gorge. That would be a comparatively new gorge, as they would call it, where the Denver and Rio Grande Railroad runs, and in a great many other places that you will readily call to mind, where there are deep gorges—the Grand Canyon of the Colorado is one of those.

Senator MORGAN. Then, if I understand you, and I want to get the predicate all right, the earth when it was formed was formed of rock and water, and there is no soil that was not formed by the operation of rock with water.

Mr. STEARNS. That is as I understand it.

Senator MORGAN. The soil was formed by the washing of water upon rock?

Mr. STEARNS. That is as I understand it.

Senator MORGAN. Very good.

Mr. STEARNS. In time water will cut a deep gorge down. It does not do that, however, below the level of the sea, because then there are no swift currents; and so, when you come to a gorge which is below the level of the sea, the geologists say that that land was originally at a higher elevation. Take, for instance, the Hudson River Valley: They say that the fact that the bottom of the rock gorge is 200 feet below the level of the sea, or more, at New York means that that land was once elevated so that the water was running swiftly enough to scour the material out of the bottom of that gorge and make a gorge.

In a similar way, here at Panama, this rock must have been at some time at a higher level than the ocean, and the Chagres River running down through there whittled out a gorge. The fact that it has done that does not mean that the rock is soft, because the Hudson River has gullied out a gorge in the same way in rock that is harder than this indurated clay. It is stated by geologists, and found to be a fact, that those gorges in rock always have a down-grade toward the sea. There were some attempts made here to see if they could not find a place where the rock would be high across these gorges, but I think it would be impossible.

On the Hudson I happen to know the soundings, and the depths from the sea level down to the rock up at Poughkeepsie is 144 feet, or thereabouts. At New Hamburg it has been mentioned in the testimony that it is 200 feet, and down nearer New York it is still deeper, showing that there was a down grade to that river at one time, when the land was elevated above the sea.

Senator MORGAN. I have always understood that the glaciers had something to do with forming these river channels.

Mr. STEARNS. I do not think that is generally admitted by geologists. They may have had something to do with it, in cases, but I have heard it stated otherwise by eminent authority.

Here at the Chagres the rock gorge has a down grade to the sea. I should have said, first, that this land, after this gorge was formed by the action of the water, sunk below the level of the sea by a gradual subsidence of the land, such as is known to have taken place in many parts of the world, and the rock gorge is shown now to be with a continual down grade to the sea, so far as the tests have been made; that is, at Gamboa, the bottom of the gorge, which is not a deep one at that place, is at sea level. The rock is about 50 feet below the ground there, and the deepest place in the rock is at sea level. Coming down the river to the next place where borings have been made, I think it may be near Buena Vista, although I am not sure of this, that depth to the rock is somewhere in the neighborhood of 140 or 150 feet. At Bohio, still farther down, the greatest depth to the rock is 168 feet; and getting down to Gatun, the greatest depth to the rock is 258 feet.

Senator KITTREDGE. You mean indurated clay?

Senator HOPKINS. He has stated what he understands by that. He calls it rock, in his testimony.

Mr. STEARNS. In general it is rock. I think it was formed as rock, although I am not an expert on that side of the question.

Therefore I believe that that gorge was formed there by the action of water, and after it subsided and the currents became quieter, then it was gradually filled up with earth brought down by the river.

Senator MORGAN. I want to call your attention to a divergence of opinion between you and other gentlemen who do not profess to be geologists, but who are engineers of high rank. They produced samples of this stuff here, called indurated clay, and they seemed to be of the opinion that it was formed by volcanic action, probably, and was silt; at all events, deposited as silt in the bottom, beneath the waters of the Chagres River and the waters of the surrounding country.

Mr. STEARNS. I should not think that was the case; although I do not know as to its formation.

Senator MORGAN. You think it was an original formation of rock?

Mr. STEARNS. I think it has been scoured out.

Senator MORGAN. You think it was an original formation of rock? They claim it was formed by the silt settling in the water, and you claim that it was an original formation of rock?

Mr. STEARNS. I do not believe there is any indication that that is the case. These gorges look as if they had been scoured out of the rock, and I believe they were—not like something that is made by settling in that way. They are unusual shapes that you see there, and the shape itself suggests the scouring action of water.

Senator MORGAN. As if it had been there and been washed out?

Mr. STEARNS. Yes.

Senator MORGAN. That is what I think; and I think it will be washed out again, if you ever get head enough of water on it.

Senator DRYDEN. This is not material, but do you suppose that these gorges were made here because this rock was of softer quality than the rock adjoining?

Mr. STEARNS. Very likely. Water will scour in the lines where there is the least resistance, and if any particular rock is softer than other rock that will be scoured faster. I know an instance of that kind where granite was adjacent to a schist or shale, and the schist or shale had scoured away so that it left that granite as a vertical wall—an overhanging wall, in fact, some 40 feet higher than the shale; that is, the shale had scoured down so much more readily. That was the case at the site where the masonry dam I have spoken of was built.

Senator DRYDEN. And would you suppose that that softer quality still persists up to the present time?

Mr. STEARNS. It is not a hard rock at all.

Senator DRYDEN. No; but I mean softer than the adjoining rock?

Mr. STEARNS. I do not believe there is very much difference. If a gorge got started in some place where it was soft the concentration of current in the middle of the gorge would continue to cut on that line even if it were harder than some of the adjacent rock.

Senator DRYDEN. That seems reasonable.

Mr. STEARNS. I was speaking of the fact that this alluvial material which fills the gorge was to a large extent brought in after subsidence of the land, so that the currents were checked by being below sea level. That is, after it dropped, there was no fall to produce scouring action, and the gravel is brought down from the Chagres, we will say, above Gamboa. If this gorge had always remained above sea level, it might have been that there would have been no deposits in it, or, if any deposits had been made, they would have been of coarse material.

But after it subsided, there was, of course, less current, and the gravels brought down by the Chagres River above Gamboa would settle as soon as the currents were retarded slightly and the finer materials would go on farther down.

The evidence of borings, both at the Gatun dam and within a mile or two of it upstream, is all to the effect that that material was deposited in sluggish currents. Mr. Wallace, in a statement before us, suggested that—and I think it is generally recognized—that the material in the lower part of this estuary was formed when the gorge sank below the level of the sea, and was then filled with fine material. There is coarse gravel up at Gamboa, and just below Gamboa there is one place there where there are stones, I should say, as big as my two fists.

Coming farther down the stream where the Chagres is crossed by the railroad one can see gravel bars; and farther down they are not as plain. Going still farther down, they disappear. That is the result of superficial observation, and it is also the result of the borings throughout. I have not them all here to show to you, but take, first, the proof that that material down there has been deposited in sluggish currents, and I can call your attention to a good many borings.

I see I had omitted one thing, the material deposited in that deepest gorge was not deposited in a sluggish current, apparently; that is, the lower 58 feet of it was deposited under conditions in which coarse material was brought along, and the fine material was washed farther out to sea. So that there is, down in that lower part there, sand and gravel which is not as full of fine material. I should not have said that the fine material was all washed out to sea, because in all these deposits of gravel there is sand deposited with stone and finer material, very often. Just referring to that point once more, I know in one place where clay is shown within that 58 feet—clay alone.

Senator MORGAN. You are now referring to the deepest of the borings?

Mr. STEARNS. Yes; the lower 58 feet.

Senator MORGAN. Yes.

Mr. STEARNS. But otherwise, in that lower 58 feet—it may be a little higher than 58 feet in places—the clay is a very large component of the material which was deposited there. When I made the first statement to the Board of Consulting Engineers on this subject—

Senator MORGAN. Let me ask you, underlying that clay is there any wood?

Mr. STEARNS. The wood has been found more or less throughout all these borings.

Senator MORGAN. Underlying the clay that you speak of is there wood?

Mr. STEARNS. Not that particular clay that I mentioned last.

Senator MORGAN. Well, any clay?

Mr. STEARNS. Oh, yes. In this deposition of material in a sluggish current there is wood and vegetable matter at times, and shells.

Senator MORGAN. In other words, then, this has washed out there and been filled up by the waters of the Chagres River, bringing down wood and clay and sand and finer material, and also, sometimes, bowlders?

Mr. STEARNS. Not bowlders.

Senator MORGAN. As far down as Bohio they find bowlders?

Mr. STEARNS. Oh, yes; but not down here.

In connection with that, when we first met we had given us certain printed information, and it included a report by Mr. Nichols, who had charge of the borings in the vicinity of Gatun.

Senator KITTREDGE. Was Mr. Nichols afterwards succeeded by Mr. Maltby?

Mr. STEARNS. Yes; Mr. Nichols is still down there, but on other work.

Senator KITTREDGE. Do you remember when Mr. Maltby succeeded Mr. Nichols at this point?

Mr. STEARNS. No; Mr. Nichols went down on the steamer with us, after a leave of absence, the last of September, and I think that when he went back there he was placed on work up at the Culebra Cut. Probably that was the time of the change, although it may have been earlier.

Mr. Nichols said, as a part of his report to the Isthmian Canal Commission: "In the test holes no bowlders have been encountered." These are the test holes in the vicinity of Gatun. He also says: "In the valley the material above the rock is composed of clay—clay mixed with sand in proportions varying from almost pure clay to nearly pure sand, and some streaks of shells and vegetation in sundry stages of decomposition, which indicated a fine material deposited in sluggish currents."

My own analysis of the material, made before these later borings were made, was this: I found that there were fourteen available borings that were made with reference to dam location in the valley east of the island at Gatun; that is, upstream from the island shown on this plan.

Senator KITTREDGE. Do you mean that central hill?

Mr. STEARNS. There is another hill that is about a mile long, perhaps a quarter or a half a mile upstream from this central island that is on the map of the dam.

Senator KITTREDGE. That is in a southerly direction, then, from the central hill that you have mentioned?

Mr. STEARNS. Yes. The lower part of this hill that I am speaking of now is shown on this plat.

There were 14 borings in the valley east of this island, and I analyzed them to see how much sand or gravel was encountered. Two of them did not have sufficient information. In the other 12 there was neither sand nor gravel encountered without clay was mixed with it; that is, it was often marked "sand and clay," but no sand alone was noted.

Senator KITTREDGE. Will it interrupt you if I ask some questions?

Mr. STEARNS. No, sir.

Senator KITTREDGE. Where were those borings made with reference to the proposed Gatun dam site?

Mr. STEARNS. There. [Indicating on map.]

Senator KITTREDGE. East of this island that you have mentioned?

Mr. STEARNS. East of this upper island.

Senator KITTREDGE. And about a mile south of the proposed Gatun dam site? Is that right?

Mr. STEARNS. No, sir; some of them were under the proposed Gatun dam site, and some of them were upstream from it. Two were under the dam site, and then there are some of them shown on this plan marked 205, 206, 207, 209, 211, 212.

Senator KITTREDGE. They were, then, except two, south of the proposed dam at Gatun?

Mr. STEARNS. Yes; ranging from perhaps 1,000 feet.

Senator HOPKINS. South would be upstream?

Mr. STEARNS. Yes. Ranging from perhaps a thousand feet, say, to a mile or a mile and a half. On the other side of this island which I have mentioned there were thirteen borings, of which I think only one is under the site of the dam as now proposed, and the others were within that distance of a mile or a mile and a half.

Senator KITTREDGE. How deep were those borings?

Mr. STEARNS. Those west of the island ranged from 116 feet to 204 feet.

Senator KITTREDGE. And how deep were they east of this island?

Mr. STEARNS. The smallest depth is 64 feet; evidently not in the bottom of the gorge; and the greatest depth was 201 feet.

Senator KITTREDGE. Did those borings disclose the presence of water at any point below the surface?

Mr. STEARNS. There was no note made to that effect, so far as I recall.

Senator KITTREDGE. You are speaking now of the borings made by Mr. Nichols?

Mr. STEARNS. These are borings made under Mr. Nichols's direction, as I understand. In fact, he told me that he made them.

Senator KITTREDGE. And his report does not disclose water, as I understand it?

Mr. STEARNS. No mention is made of it.

The thirteen borings west of the island showed sand without admixture of clay for 10 feet in one boring that was 187 feet deep; for 1 foot in a boring that was 146 feet deep; for 8 feet in a boring that was 205 feet deep, and for 5 feet in a boring that was 193 feet deep. In none of the others was there sand without clay noted. For records of gravel, gravel was noted in two cases for a depth of 1 foot in each case.

Senator KITTREDGE. At what depth?

Mr. STEARNS. I have not the record of the depth, but the total depth of one of these borings was 204 feet and the other was 197 feet.

The way I interpreted those borings was that there was so little clear sand or gravel that it was a very strong proof that that material had been deposited in sluggish currents and that it would be impervious, and I think that view was verified by the borings which were afterwards made on the line of the dam, except in that lower 58 feet which I have referred to on several occasions.

Senator MORGAN. You are not now speaking of the clay, but of what was superimposed upon it?

Mr. STEARNS. This is the alluvial material which filled gorges in the indurated clay.

Senator KITTREDGE. Where, with reference to the proposed site of the Gatun dam, was the boring that disclosed 10 feet of sand?

Mr. STEARNS. It is boring No. 54. It is not shown on this plan. I see Nos. 55 and 56 there, so that probably it was in that neighborhood. I am not sure.

Senator KITTREDGE. Then it was south, or upstream?

Mr. STEARNS. From the dam; yes.

Senator KITTREDGE. About how far?

Mr. STEARNS. The two that I have noted are about 1,500 feet upstream from the dam—a quarter of a mile.

Senator KITTREDGE. How close were those borings to each other, both east and west of the island, upstream from the proposed dam site? I do not care for any accurate figures.

Mr. STEARNS. They varied. Sometimes they were scattered and sometimes they were near together. Here are five in a bunch, and the greatest distance from the extreme ones is 800 feet.

Senator KITTREDGE. Do you find any of the borings that you are now describing nearer together than 800 feet?

Mr. STEARNS. Oh, yes. Here are two. The nearest two on this plan are a little over 200 feet apart.

Senator KITTREDGE. Do you find any borings, either east or west of the island, upstream from the proposed Gatun dam site nearer than 200 feet?

Mr. STEARNS. The nearest are just about 200 feet, possibly 175. This plan is rather small.

Mention has been made of the fact that wood is encountered, and also that vegetable matter is encountered in some places. I rather welcome the appearance of vegetable matter, because it was evidence, as it seemed to me, of the fineness of the material that was deposited there. Moreover, vegetable matter mixed in with sand makes it impervious to water.

I have done a great deal of work on that line, so that I know. Chunks of wood would not, but I do not see that they have any special significance. They would be thoroughly surrounded by sand; they are impervious in themselves, and wood under water lasts practically forever. If one were building a masonry dam on top of this alluvial material, then it would be a very serious matter to have organic matter in it, because it would settle; but in building a dam such as is proposed, with a great mass of earth, the weight on it is such that if that material settles, and it will if there is some vegetable matter there settle a little, the tendency would be rather to crowd that vegetable organic matter in with the grains of sand, in between the grains of sand, and make it all the more tight.

If it compresses it means that it puts the particles closer together, whether it is organic material alone or whether it is organic material mixed with sand. But in a dam as proposed here, with a height at the highest point of 135 feet, there is a pressure of about between 6 and 7 tons to the square foot on this earth, and the settling could not make any cracks that would go longitudinally in that material. Under such an enormous pressure it is bound to squeeze together and follow down. I do not know as I am making that clear.

In some of this material, not at Gatun, but on my own work, that had organic matter in it I put some jackscrews on it and brought a pressure of 20 tons on a small area—not as much per square foot as this would be—and when I compressed that material having the organic matter in it it made it so solid that, while it was soft surface soil at first, before pressure, after it had been pressed with that weight it was so compact that one could hardly drive a pick into it. With this enormous weight, if there is any compressible material, it will tend to crowd it together and make it solid.

Senator DRYDEN. You spoke of the sinking in this dam. Whatever it might be it would occur during the process of construction and by the time of completion?

Mr. STEARNS. Certainly.

Senator DRYDEN. Would there be any danger of its going on after the dam was completed?

Mr. STEARNS. I think it might continue somewhat after. I once built a bank that was 30 feet high on a great depth of mud. The mud was composed of organic matter and clay that had been washed from neighboring hills and drifted into this position; and that settled for three or four years, and went down a total of about 3 feet. But that was a great depth of mud; here it is sand and clay, which would not settle, except for some limited portions where some vegetable matter is encountered.

Of course I can not say accurately; but I should say that it would not probably be, under that pressure, more than 2 feet in all. I should expect that $1\frac{1}{4}$ feet of the settlement would occur, if it occurred at all, during construction, and that it might go 3 inches more afterwards. That is merely a guess of what might happen. I should not think there would be more than that in this place. If there was more organic matter it might be twice or three times that, but about in that proportion. That is, most of it would occur when the weight was put on it.

Senator DRYDEN. I do not want to interrupt the course of your statement. I do not know whether you have now arrived at a point where you want to express an opinion as to the durability and sufficiency of a dam constructed in that way.

Mr. STEARNS. Well, I am perfectly willing to express an opinion—

Senator DRYDEN. If you have not arrived at such a point I will wait.

Mr. STEARNS. I have still more to say, if you gentlemen wish to listen, as to the ground for that opinion.

Senator DRYDEN. Yes.

Mr. STEARNS. I have not much faith in an opinion that is merely an engineering guess, without some grounds for it.

Senator DRYDEN. I would prefer, then, to have you go ahead.

Mr. STEARNS. In some of the testimony which has appeared before the committee it has been stated that this whole matter here was an engineering guess. In fact, when the matter came up before the Board of Consulting Engineers, I think it was at least six weeks after I made my first statement to the Board before any criticisms that I recall were made unfavorable to the safety of the dam, and then it was made by only one member of the board, who did not criticise it at all in detail, but said it was an engineering guess, to which he would not subscribe his name.

I wish to say very distinctly that this is not, in my opinion, an engineering guess. It is as capable of demonstration as any problem that comes up in engineering; and further than that, that there has been allowed a factor of safety that is beyond all factors that have been allowed in the past.

Senator MORGAN. Beyond all precedent?

Mr. STEARNS. Beyond all precedent, except in the case of this dam which I built, which is the precedent for this particular construction.

I am going to attempt to make this clear to laymen, and I think I can. The forces which act to move a dam of this sort from its position, to wash it away, or push it away, are, first, the pressure of the

water against this mass, trying to slide it downstream. Possibly this may not be entirely clear as to what this plan is. [Indicating plan of Gatun dam.] This, by the way, is the Gatun Lake, the blue representing the water, at elevation 85. The yellow color here is the dam, with its proper proportions drawn upon the scale upon which engineering works are generally drawn, and not on the minute scale in which it is shown in the report.

Here is a suggestion of 200 feet of stone at the lower end. The rock is shown here, 200 feet below the level of the ground, the level of the ground being shown by this line, and this is the alluvial material which has filled the gorge in the rock or indurated clay.

Senator KITTREDGE. What is the upper line, just below the line indicating the bottom of the water—are those dots along there?

Mr. STEARNS. That is some of the draughtsman's artistic work, showing the dots here and here [indicating] merely to emphasize it, or give it a proper border, or something like that. It is of no significance whatever.

Senator KITTREDGE. That is what I thought.

Mr. STEARNS. Just the same as these little marks here in the rock are not intended to indicate that there are seams there, but just to make it look pretty.

The way in which dams have failed on some occasions—for instance, the Austin dam—is by sliding; that is, the water pressure against the dam was sufficient to cause a section of the dam to slide downstream. I do not think it needs the assistance of figures to show that that dam will not do so. That weighs about, as I recall it, sixty-three times as much as the pressure of the water against the upstream space. That, I think, should be obvious to a layman or anybody else—that that dam could not be pushed away as a whole.

Senator MORGAN. That would mean that the pressure perpendicularly is sixteen times as great as the lateral pressure of the water?

Mr. STEARNS. Sixty-three times.

Senator MORGAN. Sixty-three times as great?

Mr. STEARNS. Your force of gravity is sixty-three times the force that gravity produces horizontally from the water.

Senator MORGAN. There has been a point made there by one engineer or two that I just wanted to mention, and that was that this substratum of indurated clay was liable to compression on account of the great weight upon it.

Mr. STEARNS. I wish I had a sample of that indurated clay here.

Senator DRYDEN. We have had one.

Mr. STEARNS. I wonder if it was from this section.

Senator DRYDEN. I think it was.

Senator HOPKINS. Mr. Bates brought it here. I do not know where he got it.

The CHAIRMAN. He took it away with him.

Senator KITTREDGE. He got it down in the Gatun lock or in the hills. It was not at the dam site.

Mr. STEARNS. I had a core of that at one time. In fact, I saw many of them, but as one handles it and looks at it they would call it rock; and that is what it is, a fine-grained rock. I found by taking my knife that I could cut it. It looks something like a fine-grained whetstone, only it is softer than the whetstone that you use.

Senator DRYDEN. How would that compare in hardness with Indiana limestone, which is used for building purposes?

Mr. STEARNS. Oh, I do not think it is as hard.

Senator DRYDEN. That is very soft when it is taken from the quarry.

Mr. STEARNS. I am not familiar with it.

Senator DRYDEN. And it becomes harder with exposure to the elements.

Senator MORGAN. That is, from exposure to air and heat of the sun, but not to water?

Senator DRYDEN. I suppose not.

Mr. STEARNS. It would be very nearly like some soapstone I have seen, rather softer, I think. You can cut soapstone with a knife.

Senator KNOX. I tried it the other day with a knife, because it looked exactly like soapstone. I got that impression when I picked it up.

Mr. STEARNS. For any such pressures as come here that is just as good as the hardest rock that you ever saw, and it gave the impression of being very compact, so it would let no water through. I should not think there would be seams in it from the appearance of the rock. It could not let water through if there were seams.

The dam, I suppose it has been stated to you, is half a mile—2,625 feet—through. If a dam can not fall by the pressure of water pushing it away, as a whole, it must fall, if at all, through the water going through underneath or through the dam, and it could not come out here [indicating on map] after coming through, because this as high as the water in the lake itself. Down here [indicating]—

Senator KNOX. Will you permit me to suggest that when you say "here," and indicate on the map, it will not appear clearly in the record as to what point you are indicating?● I suggest that you specify distances and figures, so that the record will show what you are referring to.

Mr. STEARNS. Yes; I can modify that, then.

Senator KNOX. Say the outside of the dam, or whatever it is.

Mr. STEARNS. Three hundred and seventy-four feet from the water line the dam is as high as the water in the lake and absolutely no water can come out at that point. And at a point halfway of the thickness of the dam, the distance below the water surface is approximately about 25 feet, so that water could not come through this material and come up here. It would come up, if at all, away down toward the lower end of the dam, as springs.

Senator MORGAN. It would come up at the point of least resistance?

Mr. STEARNS. Yes, sir.

Senator MORGAN. Wherever that might be found?

Mr. STEARNS. Yes; and that would be toward the lower end of the dam.

Senator MORGAN. Probably.

Mr. STEARNS. Yes; probably.

Senator MORGAN. Yes.

Mr. STEARNS. With very little doubt. Now, if this is absolutely impervious, there would be no water to come out; but I will—

Senator MORGAN. Let me ask you, if you please, in these borings did you discover any coral?

Mr. STEARNS. None at all.

Senator MORGAN. None of them?

Mr. STEARNS. Not at this dam site.

Senator MORGAN. Did you at any other dam site that you bored across that valley?

Mr. STEARNS. I did not see any boring that showed coral. I do not think there was any. That is all found, I think, down toward Colon and Cristobal.

First, I will take up the point that this is tight underneath here, and there would be no water. That, I believe, is very well shown by the borings, and by one other thing that I did not mention. I had particularly requested, in my communication to the Isthmus—sent through the proper parties, of course—that they take a sample of the material pumped up from the boring hole in a pail, without letting anything spill over from the pail, so that it would contain both the fine material and the coarse material.

Those samples are taken by letting the water run into a pail, and then letting it overflow, in which case the coarse material is obtained and the fine material is not preserved. This sample was taken as I requested, and what we saw in the bottom of the pail was sand and fine material mixed with it, so that one would say it was practically impervious; and then the last thing that settled in the pail was the fine clay, which left a shiny surface over the whole thing, about as you see in the bottom of a mud puddle in the street after a rain, and that makes the bottom of the mud puddle pretty nearly water-tight. But it showed very clearly, as a single sample, that there was this fine clay in the material washed up in sufficient quantities to make it substantially, if not absolutely, water-tight.

Senator ANKENY. Is that surface mica? What is that shiny surface?

Mr. STEARNS. This was all clay—finely divided clay—that settled in this pail of water.

Senator ANKENY. Is it a mica?

Mr. STEARNS. No; it is a clay; alumina or some compound of alumina.

Senator KITTREDGE. From what depth below the surface did this appear?

Mr. STEARNS. I do not remember that particular sample.

Senator KITTREDGE. Do you remember from what boring?

Mr. STEARNS. I do not. It was one made so that they should give us a characteristic sample, and by this separation which occurred from the material settling in the pail it showed this very finely divided clay.

Senator KITTREDGE. Do you know about where the boring was made?

Mr. STEARNS. It was made on the line of the dam.

Senator KITTREDGE. About where?

Mr. STEARNS. Do you remember, General?

General DAVIS. I can not recall. I remember the incident.

Mr. STEARNS. I think it was in the valley, nearest Gatun, on the east side of the central island.

General DAVIS. That is quite correct. I recall it now. That is where they began that work. We were there just as they began it.

Senator KITTREDGE. How near to the railway station at Gatun?

Mr. STEARNS. That would be nothing but a guess. Within a thousand feet of it.

Senator KITTREDGE. That is quite a distance.

Mr. STEARNS. That is as nearly as I can get at it. One way of determining the safety of a dam of this sort with respect to filtration through the material underlying it is by making assumptions that instead of being impervious, that material is a pervious material; and then it becomes capable of estimation as to how much water will pass through these alluvial sections.

Suppose that, instead of the impervious material here, there was a fine-grained medium sand—I have taken that as being a medium-sized sand—I have made experiments, and they have been made by Mr. Hazen also, as to how much water will pass through such a sand, and the computations showed that if there were this medium sand, the total quantity which would pass through would be 10 cubic feet a second.

Senator KITTREDGE. Please state very briefly the conditions under which that test was made.

Mr. STEARNS. I shall be pleased to do that. I thought I would state the results first.

Senator KITTREDGE. That is all right.

Mr. STEARNS. The testimony that has already been given here as regards this matter seems to me to be very incorrect.

Senator MORGAN. Whose testimony?

Mr. STEARNS. Professor Burr's. This is on page 1616. He says: "It has been stated and is stated in the minority report that the computed seepage under the Gatun dam can never exceed about 10 cubic feet per second, and it is said that this is too small a matter to be the cause of any apprehension."

Now, the minority report does not make that statement at all. The minority report says on page 70:

"If, however, a condition which does not exist be assumed, and all of the alluvial material beneath the embankment of the dam were considered to be a clean and reasonably uniform sand of medium size, the total amount of filtration would then be for the whole length of the dam only about 10 cubic feet per second."

The minority says that that filtration is insignificant, and that if you assume a condition by which that is medium sand then it would only be 10 feet a second.

Senator MORGAN. What sand is spoken of there? Is any material of that description found in the indurated clay or in these gulches that have been mentioned?

Mr. STEARNS. The indurated clay is, in my opinion, absolutely water-tight.

Senator MORGAN. That sand spoken of is not in the indurated clay?

Mr. STEARNS. No; this is the alluvial material—

Senator MORGAN. In the deposits upon it?

Mr. STEARNS. That is it.

Now, if a fine sand be assumed, the tests that I have made show that the quantity would be $2\frac{1}{2}$ cubic feet per second, and if a very fine sand, only two-tenths of a cubic foot per second. That is, taking assumptions which, with the possible exception of the last one, are more favorable to filtration than this actual material that is here, then the filtration would not be an amount that would cause any upheaval at this end to interfere with the safety of the dam.

As to what experiments or tests warrant these statements, I will tell you.

Most of the experiments which have been referred to as laboratory experiments were made with a galvanized-iron tank filled with the said or other material to be tested, the water being applied at the top, at a constant level, and drawn out at the bottom through a faucet, and with gravel underdrainage.

Senator KITTREDGE. You are now speaking of the conditions under which the tests were made which I asked for a few minutes ago?

Mr. STEARNS. Yes. The pipes extended through these tanks, through the material which was being tested, at two levels, 3 feet apart. The faucet would be closed to a considerable extent, so as to cause the water to back up in these pipes, and the pipes being at the side of the tank with a glass tube, so as to show the height to which the water would rise, one of them would show the pressure of the water at the upper point, 3 feet above the lower one, and the other would show the pressure of the water at the lower point; and the difference in level between the water in the two tubes would represent the amount of resistance that 3 feet of sand would offer to the passage of the quantity of water then passing; and the water passing was measured carefully. By opening or closing the faucet different quantities of water could be made to pass, and the differences in amounts of resistance caused in passing through 3 feet was measured. It is rather a hard matter to explain.

Senator KITTREDGE. When was that test made?

Mr. STEARNS. These tests that are referred to in this pamphlet were made in 1891.

Senator KITTREDGE. Where?

Mr. STEARNS. They were published in 1891. They were made at the Lawrence experiment station of the Massachusetts State board of health, of which I was chief engineer.

Then another series of experiments were made in the same general manner under my charge, which covered a period of two years, in 1895 and 1896, I think. It may have been a year later. They were made with apparatus of this same kind and with surface soil taken from the ground, with gravel, both fine and coarse, and with sands of four different grades, the finest being very fine.

Senator KITTREDGE. Where were those tests made?

Mr. STEARNS. They were made in Clinton, Mass., on the Metropolitan waterworks, of which I was chief engineer. The tests made there confirmed those made at Lawrence. There was a question whether such tests would be applicable to the horizontal filtration, because they are made with the water going down vertically. So I had another set of tests made in a tank, a long wooden box 60 feet long and 6 feet wide and 8 feet high. That was filled with the material to be tested, and the water at one end was supplied as it would be at a dam. The water was raised 8 feet above the bottom of the box, the other end of the box being kept empty. As a result we found that the horizontal filtration of water through the materials, or a particular material tested, was the same as the vertical filtration, showing that it applied to both.

Senator KITTREDGE. Where were those experiments made, you say?

Mr. STEARNS. They were made at Clinton, Mass.

The next test was made to ascertain whether materials under a great pressure would behave differently from those under a pressure of only a few feet; and the material to be tested was put in an iron pipe, about

10 inches in diameter, and I think about 10 feet long, and a flange was bolted on the upper and lower ends, and the pressure due to the water supply of the town of Clinton was applied to it—something like 150 feet head. And the same laws applied under 150 feet head acting upon 10 feet of material as applied to these lower pressures.

You see I am trying to show that this is not an engineering guess; but that the engineering guess comes in in not applying this information. The laws which are deduced are simple, and I think can be understood. The quantity of water that will filter through sand or other material varies with the pressure. That is, the quantity that would filter underneath the Gatun Dam, if it had in this alluvial valley a porous material, is proportionate to the pressure; that is, with half as much pressure acting to force water through, there would be half as much go through, and so on. The experiments showed that it was directly proportioned to the pressure.

Now, as to the resistances; that was also found to be directly proportional to the length of filtering material upon which tests were made. That is, if the distance through this dam were only one-half as great as this total distance, then there would be only half as much resistance offered to the passage of water. I think a person would naturally agree that that would be the case, and that is what is found by tests. That is, if it filters one-half the distance, it will filter with the same head of water twice as fast.

Putting those things together in what an engineer would call a formula means that the quantity of water which will filter beneath any dam or through any other material is proportional to the water pressure divided by the length through which it filters. That is, the amount that would filter in a case like this, in comparing with another dam, is 85 feet divided by this total length, or, leaving out a little at each end, it would mean that it was a pressure of 4 to every 100 feet of resistance. That is because the relation of this depth to the resisting length is four to a hundred, approximately.

It is rather less than that, but it is convenient to call it four to a hundred. And the fact of this 85 feet head here is not important without one also takes into account the distance through. That is the one thing that needs to be considered for filtration, the filtration of four pressure against one hundred of resistance, and it would be the same, substantially, as a dam 100 feet thick and with 4 feet of water against it, or 200 feet thick with 8 feet of water against it. I do not know whether I have made myself clear, but the result of that experiment and of using common sense is that the quantity of water which will filter through any dam can be diminished almost at will by increasing the thickness of the dam.

To sum up what I am saying, that even if that were a porous sand of medium size there would not enough water come through here to disturb the dam; and the material is shown conclusively by the borings to have so much fine material in it that it would not filter one five-hundredth part of what medium sand would filter.

I have not attempted to go into the other laws deduced by experiments, but I will say a word or two. It is the finer particles in a sand or gravel that govern the amount of filtration, and not the average size of the whole mass. If there are 10 per cent of fine particles, it has been found that that governs the filtration.

In the experiments which I made myself—

Senator KITTREDGE. You now refer to the experiments which you have already mentioned?

Mr. STEARNS. Yes; at Clinton. These were the results: A soil, or surface loam taken from gravelly and sandy territory, and used for an experiment, would let through a quantity which I will call unity—1. Very fine sand, of which I had a sample and failed to bring it here, would let through 14; a fine sand, 176—that is, 176 times as much as soil, which is taken as the unit—the medium sand, which I have been using for the purpose of this illustration, let through 784 times as much as the surface soil; and the coarse sand, which was of uniform grade, let through 4,353 times as much as the surface soil.

Now, this material is, with its fine clay, comparable with that surface soil alone, which had the fine particles or what the geologists would call rock flour in it, and also some organic matter which is in the top soil. That is, the quantity that filters varies as the square of the diameters of the finer particles, and that is the way it works out in practice.

The CHAIRMAN. You are getting beyond our depth, now, Mr. Stearns. [Laughter.]

Mr. STEARNS. I am going to say just one other thing that you can appreciate.

I built an experimental dike in this large wooden tank that I spoke of.

Senator KITTREDGE. The Clinton experiment?

Mr. STEARNS. At Clinton, yes; and raised the water 8 feet against that dike made of this material taken from the surface of the ground. That is the section of the experiment [exhibiting section shown in pamphlet]. The water that passed through that dike was so small in quantity that it would not run in a stream from the end. As I remember, it was dripping into a bottle, when I saw it, at the rate—well, I think it was 30 drops a minute; I will not stop to look it up; but it was what a man would call water-tight. Perhaps the experimenter would say it was filtering at the rate of about a bottle full in half a day, I think.

Senator MORGAN. If you have come to a point in your statement where you wish to take up a new subject, I want to ask you, before you proceed to it, a question or two about that map.

Mr. STEARNS. I have still something more to say—

Senator MORGAN. Go ahead, then.

Mr. STEARNS. I will try not to be as technical as I have been.

It has been stated in the testimony of Professor Burr, on page 1540, that dams had failed, and he said that there were numerous instances. He was asked to give one or two instances, and he mentioned the failure of the Mill River reservoir dam at Williamsburg, Mass. This dam, built in 1865, failed in 1874, at a time when the water was 4 feet below the top, and it failed by the sloughing or caving of the lower end of the dam. A committee of the American Society of Civil Engineers was appointed and investigated the failure. They found that there was a specification which was not signed, and they could not find that there was any engineer responsible for the design or construction of the dam.

The dam was an earth embankment with a core wall 16 feet wide on top, with side slopes of $1\frac{1}{2}$ horizontal to 1 vertical. This is 25 horizontal to 1 vertical. The masonry core wall was 2 feet in thickness at the top and 5 feet 9 inches in thickness at the bottom. It was built in dry

stone and grouted, a way that engineers would not build it now. At the site of the dam there was said to be by this committee a washed porous gravel, and below that hardpan. The specifications required that the core wall should go 3 feet into the ground, so that it would not settle, but said nothing about carrying it down to the hardpan, which was only a few feet lower, so that it would cut off the water.

They did not seem to appreciate the purpose of a core wall; and they found that it was not carried down to the hardpan, but rested on this porous gravel. The slopes of the dam were found to be altogether too steep for safety. They were only $1\frac{1}{2}$ horizontal to 1 vertical; and that is about the slope that gravel when dumped naturally takes itself. It is somewhere between 1 and $1\frac{1}{2}$ to 1; so that it had not much more than the stability required to prevent it from sliding off on the downstream side itself; and the water pressure and the water leaking through this dam, together with the tendency of the earth to take a flatter slope, caused it to slough and go away. I have a section here which I will show you.

Senator MORGAN. What was the depth of the water?

Mr. STEARNS. Thirty-nine feet. It was 4 feet below the top of the dam and had been somewhat higher. It seems to me if there is any lesson taught by that dam it is that an entirely inadequate dam, built without engineering supervision and without engineering designs, stood for nine years before it failed. I have here a section of the dam.

Senator KITTREDGE. This dam of which you are speaking?

Mr. STEARNS. Yes. I had this prepared this morning. (Mr. Stearns thereupon proceeded to compare the section just referred to with the section of the Gatun dam which was exhibited before the committee.)

The comparison between the two dams, if this had been made so as to show 39 feet depth of water, would not have been easily made, and therefore I have enlarged this section proportionately. It has the true proportions, but it has been enlarged in the proportion of 85 to 39 to show what it would be if built to these same proportions, but with the water against it that is to be against the Gatun dam. That is the relative size of this dam, which is brought here as an instance, out of many, as to a dam that has failed, which might serve as a precedent for the failure of this dam.

Senator MORGAN. Is that a rock core where your finger rests?

Mr. STEARNS. Yes, sir; that was built of rubble and grouted as they call it. That is, they built up rubble-stone dry first, without any mortar, and then they poured in this mortar. Sometimes it fills the openings, and sometimes it does not. When it is not built under inspection—

Senator MORGAN. That was the only core in the dam?

Mr. STEARNS. Yes; and that did not go down to the impervious material, so that the water had a pretty free opportunity to come through here, and this gradient from here down to here [indicating on section], instead of being 4 in 100, would be, I should say, 40 to 100.

Senator MORGAN. At what point did the break commence?

Mr. STEARNS. This slid off [indicating]. I think the water came through and saturated this material, and it would not stand at that very steep angle.

Senator KITTREDGE. Came through where?

Mr. STEARNS. Underneath this wall, and probably through it also.

Senator KITTREDGE. You mean below the foundation?

Mr. STEARNS. Partly below the foundation, as this was built with porous gravel, the whole dam, according to the statement of the committee of the American Society of Civil Engineers.

Senator KITTREDGE. Did it go through the rock core or did it go under the dam?

Mr. STEARNS. I have no exact knowledge of that; but I should assume that it would go through the core in places, because that rock core, built as it was built, would not have been water-tight.

Senator KITTREDGE. Did the engineers make a report on that feature?

Mr. STEARNS. They did not; but they did make a report that it had been built in this way, by which it would not be water-tight entirely.

Senator DRYDEN. Did you say that the specifications were not originally drawn by engineers?

Mr. STEARNS. They said that they could trace those specifications to an engineer, whose name they gave, in Connecticut, but that he said that he acted only as an attorney for the owners in writing them out, and that he wrote them just as they said to write them; that is, I presume, as far as the dimensions and general features of the dam were concerned.

Senator DRYDEN. Was the construction of it under the supervision of engineers?

Mr. STEARNS. It was stated by the committee that it was not. They said that they could not find that any engineer was ever responsible for either the design or the construction.

Senator MORGAN. Notwithstanding all that, it stood for nine years!

Mr. STEARNS. Yes, sir.

Senator TALIAFERRO. What is that ridge on the side of that dam?

Mr. STEARNS. That would be dump of rock, out there about—

Senator TALIAFERRO. About the water line?

Mr. STEARNS. So that the waves coming against it will not eat away the material of the dam. This lake will always be at a constant level, or nearly so, within 3 or 4 feet, and that is put there so that the waves will not eat away the material.

Senator TALIAFERRO. Does that extend along the entire inner face of the dam?

Mr. STEARNS. Yes.

Senator MORGAN. If you are through with your other statement, I would like to examine you about that map.

Senator HOPKINS. Senator, please let him go on until he finishes this, first.

Senator MORGAN. I had asked him to do that very thing, if you will take notice of what I said.

Mr. STEARNS. I have some more comparisons to make with dams that are under construction now, to show that the factor of safety provided for this dam exceeds that of dams now being built by others [exhibiting section of dam]. That is the Belle Fourche dam, in South Dakota, for which I think they advertised for contracts, and I think it has been let to contractors.

Senator KITTREDGE. Do you know what sort of a foundation that dam has?

Mr. STEARNS. Yes.

Senator KITTREDGE. What is it?

Mr. STEARNS. Clay.

Senator KITTREDGE. No, sir; it goes down to solid rock.

Mr. STEARNS. I think you are mistaken, sir. I will get the specifications if you wish; but I have read a complete description of it by the engineer, recently. I have also the plans here, which show that it does not.

Perhaps I had better continue my description first. That is a section taken from the contract plan at a place where the depth of water is 73 feet as against 85 feet for this Gatun dam.

Senator DRYDEN. Is the dam on the same scale as this proposed Gatun dam?

Mr. STEARNS. It is. The material underneath that dam is said to be an adobe clay except at the point where a creek passes. I think that is sufficient, if you have all seen the relative size of that to the Gatun dam.

Senator HOPKINS. That dam is drawn to the same scale as the Gatun dam, is it?

Mr. STEARNS. It is drawn to the same scale, but it has 73 feet of water against it instead of 85. I have here the profile of the valley of the dam site, which I will leave with the committee. It shows the borings which have been made through the earth down to what is called soft shale rock. This plan does not show the material that was encountered by those borings, but I have seen it elsewhere stated as being adobe clay, except in the vicinity of the brook, where there was some gravel, and that it was intended to remove—

Senator KITTREDGE. To what depth?

Mr. STEARNS. To remove the gravel entirely at this creek, where it is to be found; but otherwise it is intended to make only a small cut, which is 10 feet horizontally in width and something like 6 feet deep below the center of the dam, and also to take off from the present surface the soil. The amount of cutting is indicated, and is not to go to the rock, nor is there to be any core wall of any kind. This dam, by the way, is about 1 mile in length.

The CHAIRMAN. Is that an entirely earth dam?

Mr. STEARNS. Yes, sir; formed wholly of earth, to be put on and rolled in layers. There is, however, on the upstream side to be a protection of concrete against the water, so that the water will not wash the earth away. That is one of the designs of the reclamation service, passed upon by a number of engineers whose names are given; and they have good engineers on the reclamation service, and I have no doubt the dam is safe; but it has not the factor of safety that has been given to this other one.

Senator DRYDEN. How large a body of water presses against that dam? The question I would like to ask is: What effect does the size of a body of water have upon the width of the dam?

Mr. STEARNS. The size of the body of water has absolutely no effect. It is wholly a question of depth. If you had the Atlantic Ocean pushing against the dam, it would have no more pressure than a small mill pond. There is a matter that has to be taken into account sometimes, that if the dam breaks or gives way it may produce more disaster beneath, but it will not put any greater pressure upon the dam.

Senator KNOX. It is that law of hydrostatics that saves Holland from being submerged, is it not? The dikes there hold back the whole ocean?

Mr. STEARNS. Yes.

I have one or two other comparisons with existing dams which I would like to show you.

Senator HOPKINS. Before you leave that Dakota dam, it happens that one of the members of this committee represents South Dakota, and I judge from his suggestion that he did not agree with the statement that you made that that dam is upon clay, but he thinks it is upon rock. Now, what evidence have you to support your statement to the committee?

Mr. STEARNS. Here is a profile of the valley, with the borings going down through the earth to the rock.

Senator HOPKINS. And that map which you have there shows what, with respect to the material upon which the dam is located?

Mr. STEARNS. It does not tell the character of the material. I have read that elsewhere, that it is this adobe clay. That is the statement I read, not in an official report, because I have not seen one, but in an article written by one of the engineers connected with the dam for the engineering papers. And that is the inference that I would draw from this profile here, in which it shows these borings going down through, and by the ordinary methods of showing such things, the surface of the rock at a considerable distance below the surface of the ground.

Senator MORGAN. That South Dakota dam is still standing?

Senator KITTREDGE. It is not completed yet.

Mr. STEARNS. It is not yet built.

Senator MORGAN. Oh!

Mr. STEARNS. This is a recent design.

Senator MORGAN. That is a conjecture, then?

Mr. STEARNS. I am exhibiting that in connection with the statement that good engineers have designed a dam that has a much smaller section than this Gatun dam, as indicated there. I would not say that it would be equally safe to place that dam on this Gatun foundation, because that dam is to be built without having any subsequent settlement. It would not be safe to place that up here, and yet that is a comparatively small barrier that is to be placed by good engineers to stand a large pressure of water.

Senator HOPKINS. A head of 73 feet?

Mr. STEARNS. Yes.

Senator MORGAN. Are you prepared to give your adherence to the statement that that dam is permanent and will stay there?

Mr. STEARNS. Yes; with the materials as I understand them to be. That dam has a head of only 100 feet at the extreme bottom of the creek.

Senator MORGAN. That dam has an earth core through it, has it?

Mr. STEARNS. Yes; that has an earth core.

Senator MORGAN. And the dam that you are now exhibiting has been constructed?

Mr. STEARNS. It has.

Senator MORGAN. And by the sluicing process, except the earth core?

Mr. STEARNS. That is the statement that was made, that that was conducted by the sluicing process, but I think there is some question as to whether more than a part of it was so constructed. I know it was in part. The dam is the San Leandro dam of the water company which supplies water to Oakland, Cal., and it has a height of 120

feet, and the depth of water is about 115 feet. It is 120 feet for the full height of the dam, and I know the water rises nearly to the top of it.

Senator MORGAN. About what is the width of the dam?

Mr. STEARNS. Through from the water side to the downstream side, do you mean?

Senator MORGAN. No; right across it.

Mr. STEARNS. I do not know. I only know this cross section. This is the highest part of the dam. It is the highest earth dam in the world, so far as I am aware. It has a great deal more water against it than the proposed Gatun dam will have, and yet it is not nearly as massive.

Senator HOPKINS. What is the height of that dam?

Senator KNOX. He has just stated.

Senator HOPKINS. I was outside and did not hear it.

Mr. STEARNS. One hundred and twenty feet, with substantially 115 feet of water against it.

Senator HOPKINS. Yes.

Senator DRYDEN. There is no stone used in the construction of that dam?

Mr. STEARNS. Not at all. They put in selected earth in the center.

Senator DRYDEN. What do you mean by "constructed by the sluicing process?" I do not understand that.

Mr. STEARNS. It is a process that is used in the West and California—a good deal similar to the hydraulic process of mining in gravel beds; that is, a large hose is directed against some bank of earth, and the water and earth running down together are put into wooden sluices and carried on a down grade to the place where they wish to make a fill, and they build a small embankment, and then this sluiced material would be run into a pool of water, where the material would have time to settle, and then the clear water would run off, leaving the material in the dam, and that is the process which is proposed for the construction of the Gatun dam, except that in that case the water would not be brought down through sluices by gravity, but would be pumped up by these pumping dredges, such as those used on the—

Senator MORGAN. Like those that Mr. Bates is using at Galveston?

Mr. STEARNS. Yes; that same idea. A dam would be built down here somewhere—a low dam—and the dredges working below would pump the material over, and then it would settle, the coarser materials out here and the finer materials running up in this direction [indicating on map].

Senator DRYDEN. That material would run by gravity?

Mr. STEARNS. Yes, sir; if it only went a short distance at first they would keep extending their pipe and have a small dam so that the water could not go back in this direction [indicating on map], and the material would be deposited in the dam, making a very compact embankment; and it would be feasible to get the finer materials up toward the upper end of the dam, where the water-tightness is especially desired. It could be controlled in any way they wished, to deposit the material almost anywhere, and the material to be taken from the canal below Gatun is of a very good character for that purpose. It is composed of sand and clay for the most part, and that is good material to pump; that is, there are enough fine particles of clay to fill the interstices in the sand.

Senator MORGAN. Is that material obtained in the sea, any of it?

Mr. STEARNS. Out in the harbor I think the material is much finer, and would not be as good.

Senator MORGAN. Is the material to be obtained from the harbor?

Mr. STEARNS. No; it would be obtained from the canal between the Gatun locks and the sea—and Limon Bay. The minority report proposes building a canal 500 feet wide there, for several miles, and that would furnish the material. If it did not they would make it more than 500 feet wide—enough to get all the material desired for this dam up to about the water level.

Senator MORGAN. That is not the sluicing process, though?

Mr. STEARNS. It is exactly the same, except in one case the water runs down by gravity and in the other it would be pumped up from the sea.

Senator MORGAN. It would be pumped entirely, though?

Mr. STEARNS. I should say that there would be two processes, probably: First, for the more distant points, the dredging into scows, and then bringing the scows up to the lower side of the dam and dumping the material; and then applying the pumps and dredging and pumping it up into the dam.

Senator MORGAN. The great body of the dam there is—one hundred and how many feet is it?

Mr. STEARNS. One hundred and thirty-five feet, in all; but that process would not be carried above 80 feet, say.

Senator MORGAN. The great body of the dam leading down to the bottom of that yellow on the map there would be formed of material brought down the river?

Mr. STEARNS. No. Of course the engineers that have the work in charge can do as they please, because clayey material brought down there from a part of the Culebra Cut would be satisfactory for the construction of a dam; but it was thought that it could be put in cheaper and better to take the material from the canal between the Gatun locks and Limon Bay and pump it up into this dam from some such level as this.

Senator MORGAN. You take it from the body of the earth and put it on barges, and then put your pumps on the barges and pump it into this dam?

Mr. STEARNS. That might be done.

Senator MORGAN. What better plan is there than that?

Mr. STEARNS. The other plan that I suggested was to put it in the barges that had a hopper, so that they would dump just below the Gatun dam and have a pumping dredge constantly stationed down there, which would be pumping through pipes up into the dam.

Senator MORGAN. It would have to be handled twice, then?

Mr. STEARNS. Yes.

Senator MORGAN. It would have to be put on the barge first, and then it would have to be pumped into the dam afterwards?

Mr. STEARNS. Yes; but two results are produced: One is that you are digging a canal, and the other is that you are building a dam with the same material; so that one charge might be placed against the digging of the canal and the other charge against the building of the dam. That is the way we estimate it.

I have still another plan here for comparison.

Senator HOPKINS. What is the length of that dam that you are just leaving there?

Mr. STEARNS. I do not know the length.

Senator MORGAN. Is that the dam that supplies San Francisco with water?

Mr. STEARNS. That is not that dam. It is the Pilarcitos dam, and the depth is almost exactly 85 feet, the same as it will be at the Gatun dam.

Senator MORGAN. What is that central core there—earth?

Mr. STEARNS. No; that was carefully selected clay.

Senator MORGAN. Clay?

Mr. STEARNS. Yes; and it is carried down to the rock, and a connection there made with the rock; and yet you see the size of the mass of earth—because that clay in the center is earth, as well as the rest—which sustains 85 feet of water.

Senator MORGAN. What is that serrated, salmon-colored, underlying base?

Mr. STEARNS. That was marked on the plan I had as gravel, but as I have seen it on the ground, I think it is more nearly clay. I have seen this dam. By the way, it is perfectly water-tight.

Senator MORGAN. What is the material lying above that stratum?

Mr. STEARNS. The lower mark there?

Senator MORGAN. Above that; that mountain there, or that hill?

Mr. STEARNS. This is composed of clay, all of it.

Senator MORGAN. Hauled in or sluiced in?

Mr. STEARNS. Hauled in. It was selected clay, but not as good as this which was put in the center, which was carefully selected and puddled.

Senator MORGAN. What is the depth of the water on that dam?

Mr. STEARNS. Eighty-five feet.

Senator MORGAN. What is the width of the dam?

Mr. STEARNS. I should say, from memory, that it was about 1,200 feet.

Senator MORGAN. There is no weir in it, or wasteway?

Mr. STEARNS. Oh, yes. Not in this section of it, but in another part, cut through the rock, so that it would not interfere with this earth portion of the dam. They should be kept entirely separate.

Senator MORGAN. How long has that dam been standing?

Mr. STEARNS. It was built in 1865.

Senator MORGAN. Has it ever had to be replaced or repaired?

Mr. STEARNS. It was not built to that height in 1865, but was added to, so that this is a larger dam than the original dam. I think the original dam was 20 feet lower.

Senator MORGAN. They raised the head of water?

Mr. STEARNS. Yes, sir; and there was some trouble at the connection of the core wall with the rock. I say core wall; I mean the clay core.

Senator MORGAN. Yes.

Mr. STEARNS. At one end; and they dug down there and repaired it, and at the present time it does not leak at all. There were some leaks.

Senator MORGAN. Before it was repaired it had leaked?

Mr. STEARNS. Yes.

Senator MORGAN. But had not washed away?

Mr. STEARNS. That is correct.

Senator TALIAFERRO. What is the height of that dam?

Mr. STEARNS. About 95 feet, for the height of the dam itself above the ground, and 85 feet of water against it.

Then, on the San Francisco waterworks, another dam, the San Andres dam, which is almost exactly of the same dimensions, was built several years later, and it has never given any trouble, and is absolutely water-tight, as far as one can see.

There are, of course, many other large dams, but I think this is sufficient for showing how much smaller the dams are which actually hold water under the same head than that which is proposed. There is no doubt that the dam as proposed has from two to three times the dimensions that are necessary in that place for merely holding water. But the subject of dams has been under discussion so much at Panama that they are looked at with a magnifying glass, and besides that it seems worth while, within reasonable limits of cost, to make it absolutely safe, and also so enormous in size that an enemy or a mob could not quickly destroy it by making the water run over the top.

Senator MORGAN. I do not think any enemy will ever attack the canal on either side. It would be a foolish admiral who would take a fleet into that place to fight.

Senator HOPKINS. You do not look for a naval engagement, then, in the canal itself? (Laughter.)

Mr. STEARNS. No, sir. I would like to make a reference to one other point in the tests of filtration that is not exactly a laboratory experiment, if I may do so.

The CHAIRMAN. We would like to have you give us all the information you can, to-day, Mr. Stearns.

Senator MORGAN. I wanted to ask him a few questions on this map, and this blueprint.

Mr. STEARNS. If you will let me proceed just a moment, Senator, this is a very short statement.

Senator MORGAN. Yes.

Mr. STEARNS. I have said that in the north dike which I have built, the dam which I have built which is so similar to this Gatun dam, the water has not risen to the full height against it so as to give the 65-foot pressure that is expected. It has, however, risen one-third of this height, and, according to the laws of filtration, there should be one-third of the water coming through there. As a matter of fact there is no water coming through there that has ever been noticed. That is, it has been tested to one-third of the pressure. Second, last year, when the water rose on it to a height of 20 feet above the lower point, I had previously sunk in the dike an iron pipe and had measurements taken there frequently.

On the 31st of March the water was rising, and it was at this point against the dam (indicating on map), 7 feet higher than it was in the pipe inside. That is, the water did not rise in here as fast as it rose outside. (Indicating.) Two weeks later it had risen 7 feet more, coming up on the dam to about this point (indicating on map), and in here, in the two weeks, it rose only 1 foot. Still two weeks later, making it a month from the first observation, the water was up at a point corresponding to this point that I am indicating on the dam, about one-third of the height, and the water in the pipe, although it was at that time, say, 12 feet lower than the water in the reservoir, rose only 4 feet in these two weeks.

That is, in the course of a whole month the fall from this water in the reservoir to this point in the dam [indicating] was as an average about 10 feet, showing that not enough water would filter through moderately fine sand to fill up the interstices in that sand 200 feet away from the face of the dam.

There is just one other point, that at a point corresponding to this on the dike, when there was no water against the upstream side, the water from the rainfall alone——

Senator HOPKINS. Can you not make your statements in figures, so that the record will show them intelligibly?

Mr. STEARNS. At a point three-fourths of the way through from the upstream side of the dike the water stands in that dike higher than either on the upstream or the downstream side, showing that it is the result of the rainfall, and that the material, which is earth, is so nearly impervious that even the rainfall will not pass through it. Those observations were continued for three years, and it was shown that the fluctuations of the water in the ground in this portion of the dike corresponded to the fluctuations caused by the rainfall, and that they were caused by the rainfall.

Senator MORGAN. I would like to ask a few questions. I have been trying to get an opportunity all the morning to ask about something on this map that I want to get at. Is that a longitudinal section of the proposed Gatun dam that you have there on the wall?

Mr. STEARNS. We should call it a cross section, I think.

Senator MORGAN. Well, a cross section?

Mr. STEARNS. Yes; from the upstream to the downstream side.

Senator MORGAN. And the salmon-colored part of it represents the indurated clay?

Mr. STEARNS. No; the gray or blue part here at the bottom represents the indurated clay and the salmon-colored portion the alluvial material that has filled the gorges made in the indurated clay.

Senator MORGAN. Yes; and the yellow part is the dam superimposed upon that alluvial base?

Mr. STEARNS. It is.

Senator MORGAN. That dam was drawn, I suppose, in correspondence with this blueprint [indicating profile].

Mr. STEARNS. Yes, with the portion where the alluvial material has a depth of 200 feet on the east side of the island. It does not show the deeper portion where the porous material is on the west side of the island.

Senator MORGAN. This blueprint was accepted by both the majority and the minority as a correct illustration or demonstration of the actual condition of the soil on the axis of the proposed dam at Gatun?

Mr. STEARNS. Yes.

Senator MORGAN. Both sides acted on it?

Mr. STEARNS. Yes.

Senator MORGAN. The majority and the minority?

Mr. STEARNS. Yes, I think so; on that and other information.

Senator MORGAN. Well, they agreed upon this?

Mr. STEARNS. That was presented by the Isthmian Canal Commission, and we all accepted it as being correct.

Senator MORGAN. That is all I want to know. Therefore you must have acted upon it and agreed upon it

I notice here at the bottom of the print that the first number is 250, the next is 500, the next is 1,000, and the next is 1,500. They seem to be divisions of 500 feet. That is for mere convenience, I suppose, of locating the borings and all of that matter?

Mr. STEARNS. Yes.

Senator MORGAN. In considering this map, do you go from left to right, or from right to left, in the study of it?

Mr. STEARNS. From the left to the right is the natural way.

Senator MORGAN. That means sections of 500 feet breadth in one direction, from left to right. These sections from the bottom of the map to the top represent the measurements down to and below the sea level?

Mr. STEARNS. Yes; they are numbered down from sea level and up from sea level.

Senator MORGAN. And this heavy line of white across there is the sea level?

Mr. STEARNS. Yes.

Senator MORGAN. The bed of the Chagres River, from the blueprint, is delineated as being 10 feet below sea level?

Mr. STEARNS. Yes.

Senator MORGAN. The bottom of the canal would be 40 feet below sea level?

Mr. STEARNS. Twenty.

Senator MORGAN. Twenty feet below sea level?

Mr. STEARNS. Yes.

Senator MORGAN. Is that the depth of the canal that you want to dig through there?

Mr. STEARNS. No; it is 40 feet below low tide, below Gatun. But that canal at that place would be all filled by the dam. That is the existing French canal.

Senator MORGAN. Oh! The existing French canal?

Mr. STEARNS. Yes, sir.

Senator MORGAN. The proposed canal, then, would be twice as deep—40 feet?

Mr. STEARNS. Yes; below low tide, making 41 feet below mean tide at that place or just below it.

Senator MORGAN. This is the French canal, and the canal that we propose to dig goes 20 feet deeper. Now, let me ask you, if you please, what is this outside, uppermost mark on the blueprint here?

Mr. STEARNS. That is the surface of the earth.

Senator MORGAN. As it is now?

Mr. STEARNS. As it now exists, yes, at the site of the dam.

Senator MORGAN. In the borings here on the west, I suppose—

Mr. STEARNS. That is east, that way.

Senator MORGAN. East?

Mr. STEARNS. Yes; that is the east side.

Senator MORGAN. In the borings from east to west you come across a deep gulch, reaching down to indurated clay to a depth of—

Mr. STEARNS. About 200 feet, or a little bit over.

Senator MORGAN. About 205 feet, according to this.

Mr. STEARNS. About 205 feet, yes.

Senator MORGAN. And at the top the width between this point and this [indicating] is a width of about how far?

Mr. STEARNS. About 1,800 feet.

Senator MORGAN. About 1,800 feet across?

Mr. STEARNS. About 1,800 feet at sea level from the indurated clay on one side to the indurated clay on the other.

Senator MORGAN. We will call that a geological gulch.

Mr. STEARNS. Yes.

Senator MORGAN. For the sake of convenience. Maybe it is not a proper description. But that geological gulch is 1,800 feet wide and 205 feet deep, if I understand it?

Mr. STEARNS. That is correct.

Senator MORGAN. That is filled up with all kinds of material that has been washed in there by the water, beginning at the bottom with clay or sand and then going up through timber, rotted in different degrees of decay, and so on, as described in the statements both of the majority and minority, going on until you get up to the surface of the canal?

Mr. STEARNS. To the surface of the ground, yes, sir; except that I should say that the timber would be an occasional thing, and hardly one of the general features.

Senator MORGAN. But it is an occasional hole in the ground that causes destruction, is it not?

Mr. STEARNS. Yes; but the timber would not be a hole in the ground. It would be timber, surrounded by sand or clay.

Senator MORGAN. I understand that timber is not a hole in the ground. You propose, if I understand you, to put your dam across this wide gulch here, superimposed upon this material that we have just been describing?

Mr. STEARNS. Yes; with some preparation of the site.

Senator MORGAN. With some cleaning off of the looser top?

Mr. STEARNS. A cleaning off of the looser material at the top, and if there should be anything else that needed to be taken off, it is supposed that it would be taken off.

Senator MORGAN. When constructed, the weight of that dam will rest for 1,800 feet upon this material that is delineated and demonstrated and proven by the borings that have been made?

Mr. STEARNS. It will.

Senator MORGAN. Yes; and you call that a safe dam for 1,800 feet?

Mr. STEARNS. I have not a question of it. I know it is safe.

Senator MORGAN. I am not questioning it. I am asking you the question.

Then, in proceeding from east to west, you come across a still deeper gulch of the same sort?

Mr. STEARNS. Yes; except that at the bottom of that gulch there is porous material.

Senator MORGAN. At the bottom of this gulch there is porous material?

Mr. STEARNS. Yes.

Senator MORGAN. Right at the bottom?

Mr. STEARNS. In the lower 58 feet, or possibly a little more than that.

Senator MORGAN. In the lower 58 feet is porous material, then?

Mr. STEARNS. Yes.

Senator MORGAN. How would you describe that with reference to its geological characteristics?

Mr. STEARNS. Why, it is sand and gravel that has been deposited without an admixture of clay, so that there are interstices, and it is, therefore, porous.

Senator MORGAN. Then it proceeds upward, as described here, and what is the width of that gulch at its top?

Mr. STEARNS. About 850 feet at sea level, between the indurated clay on one side and the indurated clay on the other.

Senator MORGAN. Across that second gulch there is the spillway to be constructed?

Mr. STEARNS. No, sir.

Senator MORGAN. I have not gotten to it yet?

Mr. STEARNS. Yes; you have passed the spillway.

Senator MORGAN. Where is the spillway?

Mr. STEARNS. The spillway is to be located in this indurated clay.

Senator MORGAN. In this indurated clay?

Mr. STEARNS. Yes. First, the cut would be made through there, down to sea level, or a little below, through which the Chagres could be turned while the earth embankments were being made over these two alluvial valleys.

Senator MORGAN. Now, then, what is the width of that spillway?

Mr. STEARNS. The diversion channel, which would be made first, is 150 feet wide.

Senator MORGAN. Yes.

Mr. STEARNS. But the spillway would have a much greater width.

Senator MORGAN. Yes. By the diversion channel you mean a channel dug temporarily to get rid of the waters of the Chagres River?

Mr. STEARNS. Yes.

Senator MORGAN. That diversion channel will be included in the spillway when it is completed?

Mr. STEARNS. Yes. The water that spills over the dam will go into the lower portion of that diversion channel and run out through this channel, made in the indurated clay and lined with concrete.

Senator MORGAN. So that it is a connected work, and the diversion channel and spillway, when the dam is completed, will comprise one part of the controlling works of the Chagres River?

Mr. STEARNS. Yes; you asked the width of the spillway. The total width is 810 feet.

Senator MORGAN. Of the spillway?

Mr. STEARNS. Yes.

Senator MORGAN. Which takes up the diversion works and applies them or appropriates them.

Then, to proceed to the spillway, we come to the gulch that you have just been speaking of?

Mr. STEARNS. Yes.

Senator MORGAN. Does your dam then run into the hills immediately?

Mr. STEARNS. It does; into hard land.

Senator MORGAN. At what point right here? Just indicate, please, on this blueprint.

Mr. STEARNS. Right there [indicating].

Senator MORGAN. That is about 5,800 feet long the dam would be, beginning here—no; it would not be; the dam would be from this point to this [indicating on profile]?

Mr. STEARNS. Yes; I should say about from here [indicating on profile].

Senator MORGAN. What would be about the width? You need not get it accurately.

Mr. STEARNS. The point you refer to is about 4,800 feet from the easterly end of the dam.

Senator MORGAN. And that would describe the width of the dam in that part of it?

Mr. STEARNS. Yes.

Senator MORGAN. That is the dam proper?

Mr. STEARNS. Yes, sir.

Senator MORGAN. That is the dam you have got delineated there [indicating map on the wall]?

Mr. STEARNS. Yes; except that for a portion of the way it is not like this. It is only in the alluvial valleys that it would have anywhere nearly this height [indicating on map].

Senator MORGAN. Will the locks be at the east or the west side of this blueprint?

Mr. STEARNS. At the east side.

Senator MORGAN. That would be over here, to the east [indicating on profile]?

Mr. STEARNS. Yes.

Senator MORGAN. What width will they occupy of excavation in order to set them in there?

Mr. STEARNS. I think about 330 feet as the bottom width of the excavation which may be made for them.

Senator MORGAN. For making the seats of the locks?

Mr. STEARNS. Yes.

Senator MORGAN. Do the seats of the locks adjoin—touch and form part of the dam? Are they connected together?

Mr. STEARNS. They are connected together, but the dam becomes so small at the location of the locks that I think the natural ground is above the water line; so that the portion of the dam would only be this superimposed part—this higher portion.

Senator MORGAN. Yes.

Mr. STEARNS. It is hardly the dam proper, and yet it is the embankment made so that the water can not possibly overtop it.

Senator MORGAN. This blueprint contains every notable fact that was considered by the Commission and Consulting Engineers, I will call them, in their examination of this Gatun dam?

Mr. STEARNS. No; they had the plans showing the topography of the section, and then there were, in addition, borings which I have already called attention to, made above this particular site, prior to our going down to the Isthmus, which in themselves were sufficient to show that this material was deposited in slow currents, and must, therefore, be fine material.

Senator MORGAN. Those additional borings you have mentioned support and sustain the conclusions, as you think, that were reached by the minority?

Mr. STEARNS. I do.

Senator MORGAN. That is, your proposition?

Mr. STEARNS. Yes, sir.

Senator MORGAN. They were done for that purpose, of ascertaining whether it was safe to rely upon the borings across the site of the dam, I suppose?

Mr. STEARNS. There were original borings which did not extend under the site of the dam, except to a limited extent, and we thought it desirable to have additional borings directly at the site of the dam, so as to verify the conclusions reached from the others.

Senator MORGAN. In your description of the formation of the earth you started out with the proposition that it was formed of rock, and then water in combination, and that the water washed the surface of the detritus of the rock down and formed this beautiful soil we are living on?

Mr. STEARNS. Yes. It formed first the geological gorge, as it has been called, and washed the fine material out to sea.

Senator MORGAN. And washed on until it made these beautiful gardens and hills and mountains that surround us?

Mr. STEARNS. What I said was that——

Senator MORGAN. It seems to me that you have omitted two prominent and very important factors in that matter. One is fire and the other is the coral insect.

Mr. STEARNS. Well, I think these actions took place while the valley was above the sea level, and the coral insect did not climb up to that height.

Senator MORGAN. You admit that volcanic action has had a good deal to do with lifting rocky material and melted rock and stones out of the bosom of the earth and throwing them out and scattering them over the valleys and hills, and so forth?

Mr. STEARNS. Yes, indeed.

Senator MORGAN. It has had a great deal to do with it. Is it not your opinion that this soft material that has become indurated (and from being called indurated, must have been soft and then made hard) was in a large part the débris or the ashes thrown out by the extinct volcanoes, of which there are many on that section of the Isthmus?

Mr. STEARNS. I should hardly want to put my judgment against that of anyone else as to how that was formed, but I think there is not much question but that, however it was formed, it was formed so that the gorges were the result of the action of the rivers flowing through them, which carved them out. I do not see how they could have taken that form by volcanic action.

Senator MORGAN. Would it not be a reasonable proposition or supposition that the coral plant had built a rim of stone around the sea; that the volcanoes had belched forth their ashes and their lava, and so on, and their fine material, and that the waters had washed these ashes down against that coral reef, and they had been deposited there and indurated by the process of time and by the attractions that exist between small particles of matter, either under water or above water?

Mr. STEARNS. I hardly think I could give an opinion of value on that point.

Senator MORGAN. You are a geologist?

Mr. STEARNS. Oh, no.

Senator MORGAN. You are not?

Mr. STEARNS. No, sir.

Senator MORGAN. I took it for granted that you were.

Mr. STEARNS. I said I had listened to explanations of geologists, and I have also had a geologist in connection with my own work.

Senator MORGAN. I am sitting at the feet of Gamaliel, getting infor-

nation. That is what I am trying to do. These ideas come into my mind because facts suggest them.

However this formation may have taken place, the indurated clay that you find at the bottom of these waters under the site of the proposed dam at Gatun has been built up there, has it not, in your opinion?

Mr. STEARNS. It was built up originally, and then was carved out by the action of water, to make these gorges.

Senator MORGAN. If the action of the water has carved out these gulches in here, and afterwards, by being resisted by the incoming sea water, has been deadened in its movement, so that it no longer carves out these deep places, is it not supposable that all the material that you find deposited in these two deep gulches here has been imported from mountains?

Mr. STEARNS. I think so; from the higher land.

Senator MORGAN. There is no doubt about that?

Mr. STEARNS. I do not think there is any doubt about it. It has come from the higher land, except that with tidal action backward and forward in there, there might have been some of it brought in from the sea, and shells might have grown there, or been brought in by these tidal currents, when the gulches were submerged below the sea level.

Senator MORGAN. Would not that process of scouring and carving out of this indurated clay have gone on until this day if it had not been for the action of the sea water in coming in and protecting it?

Mr. STEARNS. It is rather difficult to answer that question. Sometimes conditions are reached by which the heavier gravels will deposit in a rock gorge, so that the stream will flow over a bed of gravel and not cut any further down into the gorge. At other times the rock remains bare, and then the current of the river would at this day as well as at any day in the past continue to cut down into the rock.

Senator MORGAN. Is it the opinion of geologists that the eastern coast of Panama, I will say, is rising or falling?

Mr. STEARNS. I do not know.

Senator MORGAN. You have not looked into that?

Mr. STEARNS. No.

Senator MORGAN. Some statements have been made about it that have astonished and alarmed me by geologists. I do not pretend to be anything approaching that sublime state of civilization.

The CHAIRMAN. Would it be agreeable to you, Senator, to take a recess now until 2 o'clock, or 2.15?

Senator MORGAN. Yes. I shall not be here this afternoon, and I suggest that it is very necessary to have copies of this blueprint made for the use of the committee and the Senate. (Referring to blueprint profile, the original from which plate 12 was prepared.) It is the most important document that is in this whole case.

The CHAIRMAN. Very well.

Senator KITTREDGE. I agree with you, Senator, about that.

The CHAIRMAN. That seems to be the only copy that the Commission possesses. They sent it down to us and they say that it is the only copy that they have.

Senator KITTREDGE. They sent us what purported to be a copy, but was not.

Senator MORGAN. It is a very precious thing if that is the only copy that they have got and it should be printed at once. I hope the com-

mittee will pass an order that the chairman be requested to apply for permission to have it printed.

The CHAIRMAN. If there is no objection, that will be done.

Senator KITTREDGE. Mr. Stearns, Mr. Walcott telephones me that I am correct in regard to the foundation of the Belle Fourche dam. He says that there is a masonry core extending to the solid rock. I wonder why they put that masonry core down through that earth dam to solid rock?

Mr. STEARNS. Well, it is rather surprising that they do not show it on an official plan, on which they base their contract.

Senator KITTREDGE. I want to know what you have to say in answer to the question.

Mr. STEARNS. My information is that they did not.

Senator KITTREDGE. You gather it from these maps?

Mr. STEARNS. Yes; I do not see why they should, if that will answer your question.

Senator DRYDEN. These maps are published by the Government?

Mr. STEARNS. They are; and they are the plans which were submitted at the time contracts were asked for, and purported to be the official plans for the purpose of letting the contract. It seems to me there must be some misunderstanding.

Senator DRYDEN. The contractors' estimates were based upon the specifications and those maps, then, I suppose?

Mr. STEARNS. I have no doubt that they were.

(After an informal discussion concerning further witnesses to be called before the committee, a recess was taken until until 2.15 o'clock p. m.).

AFTER RECESS.

STATEMENT OF FREDERIC P. STEARNS, ESQ.—Continued.

The CHAIRMAN. Mr. Stearns, I think if you are ready to proceed now and make further statements to us, we are ready to have you do so.

Mr. STEARNS. Professor Burr, in his testimony on page 1540, after citing the case of the Mill River dam disaster, which I referred to this morning, makes this statement:

"Then, again, there is a reservoir which has been completed for the borough of Brooklyn, called the Milburn reservoir, which I have inspected in the course of my professional work for the city of New York, which was completed in 1893. That reservoir was completed under engineering specifications, with a puddled bottom, designed and put in place for the express purpose of preventing leakage. Yet when it was filled with 43,500,000 gallons of water it all leaked out in ten days, and that reservoir has never been in use since. That shows what water will do when it has a chance, even in so-called impermeable material."

Now, what is the condition, and how does that have any bearing upon the safety of the Gatun dam?

The facts are these, and they are taken from a public document entitled "The Brooklyn Water Supply," dated 1896.

The reservoir in question is a rectangular, artificial reservoir, having an area at high-water line of 48 acres. The ground on which

it was built was the very porous sand and gravel found on the southerly side of Long Island. In order to make the reservoir watertight, its bottom was to be covered with 2 feet in thickness of puddle, which it was provided in the contract should consist of 20 per cent of pure clay, to be mixed with materials found on the ground. It is stated elsewhere that in the actual construction more clay was used than was originally provided for.

On testing the reservoir it was found to be leaky, and an investigation was made in 1894 by Mr. J. J. R. Croes, who has since that time been president of the American Society of Civil Engineers. He made tests which, he says, "appear to establish beyond question that the whole bottom of the reservoir is a filter bed, pretty uniform in character, and passing water at the rate of two-tenths foot per day under a head of 3 feet, four-tenths foot per day under 6 feet, and six-tenths under 9 feet."

It will be seen from this statement that the conditions at the Milburn reservoir were entirely dissimilar from those at the Gatun dam. The material to resist filtration at the Milburn reservoir was 2 feet in thickness, while at the Gatun dam it is half a mile in thickness. If the comparison shows anything, it is that material which was not wholly impervious under a pressure of 9 feet of water permitted water to pass only at the slow rate of six-tenths of a foot a day.

I have said that the speed of filtration is due to the relation of the pressure of water to the thickness of the filtering material. Here was water that was four and a half times the thickness of the filtering material, instead of being one twenty-fifth of the thickness of the filtering material. The relations are so widely different that it has no bearing, and in any case the experiments show that the filtration was proportional to the head, which is the law I have tried to lay down to you, as proved by experiment.

The next instance which he cites to show that the Gatun dam may not be safe is that—

"Nothing is more common in the experience of waterworks engineers than to observe the underground flow of water through permeable or semipermeable material. In fact, many water supplies depend upon that flow, such as the borough of Brooklyn and many other cities that take their water from the deep underground sands or mixtures of sand and earth. You will find frequently small passages of water, some of them threadlike in magnitude, almost capillary passages, and from that up to passages that flow many gallons a minute."

I have at the hotel, but forgot to bring with me, a sample of this Long Island sand, which is extremely porous, and which will run almost like hour-glass sand when poured from one thing to another. It would be impossible for any passages to be formed in such sand. They would fill up. Besides, all of the information that we have with regard to the water coming into driven wells can be accounted for without the existence of such passages. The sand grains have interstices between them, and the water filters freely through those interstices to the wells—not through large passages, but through the interstices between the sand grains. It is obvious that no one has ever been down there to find out, and there is no reason whatever to think that such passages exist in sand.

Senator HOPKINS. At Gatun you mean?

Mr. STEARNS. At Gatun or anywhere else. I have had occasion, in building aqueducts and in building deep trenches in connection with the building of dams and dikes, to excavate in sand to great depths, and I never saw such a passage. Professor Burr speaks of it as being of most frequent occurrence. It is a thing that I have never seen, with a great deal of experience in those lines.

So that I think that any suggestion of underground passages in sand or sandy material or earth, especially when it is under a pressure of many tons to the square foot, is not based upon any correct observation of facts.

The statement made goes on to say:

"There are wells fed by such water on Long Island, and in our recent examinations for a tunnel under the Hudson River near New Hamburg we found such a passage by diamond-drill borings about 260 feet, if I recall the depth rightly, below the surface."

That might and certainly does give the suggestion that those are passages in sand. But I will call attention first to the fact that he mentions diamond-drill borings, which are only used in excavating through rock; and I also know that those borings made in New Hamburg (for I am connected with that same work) are borings into limestone, and it is common to find cavities in limestone. Those are found in the Mammoth Cave, for instance, where there are streams that flow through the limestone; and all over the country there are cavities in limestone. But it is not pertinent in the least to bring a statement of that kind here in connection with this alluvial material under the Gatun dam.

In answer to a question from Mr. Kittredge, "When was that, Mr. Burr?" Professor Burr goes on to say:

"Within three months—two months and a half ago; and those are not uncommon experiences. They are within almost, you may say, the daily range of hydraulic engineers or civil engineers engaged in that class of work."

It is a fact, if it had been so stated, that cavities in limestone are frequent; but the inference to be drawn from that is that it is a cavity in sand, and that that cavity might find its way through this half mile of dam and cause a hole through which water could flow with sufficient speed to wreck the dam, and I say that it is groundless.

In the next paragraph it is stated that "as an engineering guess, you might say that it probably would stand," but it goes on to say that there is grave danger. It seems to me it is decidedly an engineering guess that there is any possibility of passages.

I will not go into that matter further.

Senator HOPKINS. Your claim is that there is no guess about it, but that it is demonstrated to a certainty that the dam will stand as put there?

Mr. STEARNS. Absolutely; and it is the ignoring of the information obtained in the last fourteen years in regard to the movement of water through sands and other earths that makes any such statement as is made here by a member of the majority an engineering guess which is a very bad one.

Reference has been made in some of the testimony to an upward flow of water through some of the pipes driven down into this geological gorge at the Gatun dam. The principal flow occurred in pipes that extended down into that 58 feet in depth of porous mate-

rial in the deepest gorge—that 58 feet of material, or thereabouts, being under about 200 feet of impervious material.

The height of the top of the pipe when that flow occurred, as regards the level of the water in the river, is not given; but the surface of the ground at that point is 7 feet above the surface of the river, and probably the pipe stuck up somewhat farther at the time this flow occurred. I think it is fair to say that the pipe would probably have been at least 10 feet above the surface of the river, showing that in that pervious material at the bottom of the gorge the water was under greater pressure than that due to a height of 10 feet above the river.

Now, the river for 10 miles up to Bohio is at sea level; consequently that water could not have come from the river, because it would not filter 10 miles underground. Water does not do that unless it has a great deal of pressure to force it through; and it is a proof of the imperviousness of this blanket of 200 feet of material, because that water evidently came from some of the adjacent high ground, probably only in small quantities, and got under that 200-foot blanket of impervious material and could not find its way out into the river and relieve itself—that is, 10 feet more head or more pressure at the bottom of the gorge than that due to sea level did not force that water to relieve itself, because it was overlaid with such an impervious material.

The letter from Mr. Maltby sending these borings contained at the end a statement, after speaking of this upward flow of water, that it proves the impervious character of the 200 feet of material above it.

That porous material, which in the report of the majority is spoken of as if it might be almost anywhere under the section of the dam, is down under this blanket, so that there can be no communication with it. This salmon color here [referring to map] represents 200 feet, and the pervious material is below it; and that would require 200 feet of filtration down at that end, then filtration for half a mile through that pervious material to the other end, and then the rising of the water again through another 200 feet at this end; and that could not take place.

But I made one computation that, supposing (and this is a supposition or an assumption) that this impervious blanket were entirely taken off and the water had free access to that porous material at this point, and again the blanket were taken off at the lower end and the water had free access to that part, then the pressure of 85 feet acting upon that material, if it was as porous as the most porous sand that I was able to test, or as porous as the Long Island sands, or as porous as the coarsest gravel that I had occasion to test, would let through but 2 cubic feet of water per second. Of course that does not occur and will not occur, because the impervious blanket will stop it; but even if there were free communication, it would mean a quantity of water that could have no significance, either in the loss of water for canal purposes or in regard to the safety of the dam.

It is stated in the majority report (p. 47), among many suggestions as to the great gravity of the situation if the dams proposed by the minority should be adopted, that "the Board is therefore of opinion that the existence of such costly facilities for the world's commerce should not depend upon great reservoirs held by earth embankments

resting literally upon mud foundations or those of even sand and gravel. The Board is unqualifiedly of opinion that no such vast and doubtful experiment should be indulged in, but on the contrary that every feature of whatever nature should be so designed and built as to include only those features which experience has demonstrated to be positively safe and efficient."

I claim for the dams which are proposed by the minority that experience has demonstrated that they are absolutely safe and efficient, and that they have been carried in dimensions away beyond past precedent so as to make them doubly safe. The sea-level canal requires dams; and one proposition is a dam at Gamboa with a core wall of concrete extending from the rock upward at a place where the rock is 170 feet below the water level of the proposed reservoir. That suggestion is a suggestion that is far beyond actual precedent.

I have not any question but that there is actual precedent that would support the building of such a dam, and that it can be made perfectly safe. But while saying that they should not go beyond actual precedent, the majority, in the suggestion of a core-wall dam at that place, have gone far beyond actual precedent, for I know of no core walls in existence that are more than 125 feet high from the rock, while this is up to 170, if it is built away up to the surface of the water. I do not know whether they have decided to do that or not, but, anyway, the foundations are down 170 feet under water.

There is also the suggestion that that could be a solid masonry dam; but I never say any plans drawn with reference to one for that elevation, although plans have been drawn for one of a somewhat higher elevation which may have been used as a basis for that statement, that it would cost the same.

Senator KITTREDGE. May I ask just one question?

Mr. STEARNS. Certainly.

Senator KITTREDGE. You say 170 feet below water?

Mr. STEARNS. The rock at the lowest point on which the core wall would be based is 170 feet below the proposed water level.

Senator KITTREDGE. Below maximum water level—is that it?

Mr. STEARNS. That is the maximum water level; yes—the greatest height.

Senator KITTREDGE. You do not mean that the foundations of this dam are 170 feet below the surface of the water?

Mr. STEARNS. Below the surface of the water after it is raised to its highest level.

Senator KITTREDGE. That is the point.

Mr. STEARNS. Certainly.

The majority report makes only a very casual reference to the other dams which are to retain the reservoirs shown upon this plan. You will see them in blue toward the bottom of the plan. They are the dams across the Gigante and the Caño rivers, and the Gigantito.

An engineer, a member of the majority, in describing those dams in a preliminary way, suggested that they be made of earth without any core wall, and that they be carried 15 feet instead of 50 feet above high-water level in the reservoir; that they be made 50 feet wide on top instead of 100, as proposed here, and that they be given slopes of one on three, which are similar to those slopes extended down here and to this slope extended down here [indicating].

That is suggested in a place where there have been only the French surveys, where nobody has examined the sites, where the material has not been bored to find out its character nor the depth to the rock. He evidently did not have the fear of earth dams before his mind when he presented a plan of that kind.

Senator DRYDEN. How deep a dam did he propose?

Mr. STEARNS. I have a note here in his handwriting—the Gigante, 55 feet; the Gigantito, 60 feet; and the Caño, 65 feet. Those are depths of water down at the lowest point—that is, from the ground at its lowest point up to the water. Those figures are substantially the same as the figures for the proposed dams at the Pacific end, which I believe some members of the majority have thought might not be sufficient.

I should say that I think it is possible, in construction, by making deeper cuts through the summits, to diminish the depths at those dams, and there is no doubt they can be built safely; but I do not think that allowances were made for that in the estimates.

I merely wanted to call attention to this as showing that at that time at least one member of the majority did not have the fear of earth dams in mind.

I once had occasion to build a very small earth dam across a mill pond, where common gravel was dumped into the water, and there was no difficulty in pumping out the water on the downstream side of it. A good deal of water leaked through, but we never questioned the stability of that particular dam. I saw, within a month, an earth dam with some sheet piling in it, a cofferdam, on work with which I am connected as consulting engineer. It is work in which a tidal lock is to be built; and the water was coming through that dam so that the ground was wet for 10 feet up on the downstream side. The pressure at that time against the dam was about 40 feet. No one suggested that even with water coming through the dam there was any special danger.

However, I would not recommend a dam of that sort, without a larger factor of safety, for permanent work. It is rather an instance, though, that a dam of as small dimensions, I should say, as that Mill River dam, or very nearly so, with some sheet piling, which was not tight, as shown by the water coming through, held the water perfectly; and this dam proposed here has twenty times the thickness and four hundred times the strength, I should say. I think it would vary about as the square of the distances.

I think that concludes any statement I have to make with regard to dams.

Senator KITTREDGE. Would it be convenient for me to ask you here some questions about the dams?

Mr. STEARNS. Yes, sir.

Senator KITTREDGE. I notice that the maximum level of water is 85 feet.

Mr. STEARNS. Yes.

Senator KITTREDGE. Is that the maximum height at all seasons of the year?

Mr. STEARNS. It is expected that at the end of the rainy season the lake will be raised and held 1 foot higher than that, and in times of great floods it is expected that the water will go as high as eleva-

tion 87—that is, 2 feet above its height that is shown—but that would be only for a short time.

Senator KITTREDGE. What is the elevation of the spillway that you propose west of the hill?

Mr. STEARNS. The spillway is located on the central hill, and the sills of the spillway are to be 15 or 16 feet lower than the water at its normal level. The spillway gates correspond to those at the Chicago Drainage Canal, being almost exactly of the same dimensions.

Senator KITTREDGE. At what height will the water be before that spillway is used?

Mr. STEARNS. At the beginning of a very heavy rainfall, at a time when freshets would be expected, it is also expected that the gates would be opened, and there would be 15 feet depth of water going through the gates when opened, so that it would maintain the level of the lake without its rising, as a rule.

Senator KITTREDGE. Why do you have the surface of the water higher at any time than 85 feet?

Mr. STEARNS. If raised a foot at the beginning of the dry season, after the danger of freshets is over, there would be 1 foot more of water for lockage purposes during the dry season, so that it would be better to have it a foot higher than the normal level and draw it down during the dry season, perhaps, to the normal level or a little below; that is, there must be some fluctuation during the dry season, after the navigation gets to be large, in order to provide the water for lockage, and by starting a foot high it will prevent drawing it quite as low.

Senator KITTREDGE. What is the lowest point that it would reach in the dry season?

Mr. STEARNS. The lowest point, with a traffic equal to, say, 40,000,000 tons per year, would be 3 feet below the normal level.

Senator KITTREDGE. That is, down to 82 feet?

Mr. STEARNS. Yes.

Senator KITTREDGE. And you have calculated so that you can state positively that that would be the maximum height in dry seasons?

Mr. STEARNS. Yes; that would be not only in ordinary dry seasons, but in the driest season on record.

Senator KITTREDGE. How long do you figure that it would require to fill that lake after the works were completed?

Mr. STEARNS. I have not made any careful figures, but I think, about a year; but the filling would be done in part before the works were completed.

Senator KITTREDGE. What is the name of the reservoir with which you are connected?

Mr. STEARNS. It is known as the Wachusett Reservoir.

Senator KITTREDGE. Is that filled with water?

Mr. STEARNS. It is not at the present time.

Senator KITTREDGE. What is the height of water now?

Mr. STEARNS. Eighty-five feet.

Senator KITTREDGE. What is the height proposed?

Mr. STEARNS. One hundred and twenty-nine.

Senator KITTREDGE. The height you have given is measured from the lowest point in the reservoir?

Mr. STEARNS. Yes. It is at the height against the dam that is shown in this photograph—against the masonry dam, not against the earth dam [referring to photograph].

Senator KITTREDGE. I was there last November, so I am familiar with the location.

Mr. STEARNS. Yes, sir.

Senator KITTREDGE. I noticed when I was there, Mr. Stearns, that you had a masonry dam there.

Mr. STEARNS. There is a masonry dam across the main river, which is shown in the photograph to which I just called attention.

Senator KITTREDGE. And what are the dimensions of that dam?

Mr. STEARNS. The distance from the lowest point in the bottom of the rock gorge to the surface of the water is 189 feet. The width across the valley is 1,250 feet; but the main dam, as it is called—

Senator KITTREDGE. You are speaking now of the masonry dam?

Mr. STEARNS. Yes; the masonry dam is about 900 feet long, for what is called the main dam, that rises 20 feet above the water surface; and then there is an extension of that, where the height of the dam is very small, over which the water flows as a spillway, and that is about 450 feet in addition. It is carried upstream so as to give it a greater length than it would have if it went directly across the valley.

Senator KITTREDGE. What is the dimension of the dam up and down the stream?

Mr. STEARNS. At the water line it is about 25 feet thick, and 189 feet below the water line it would be about 189 feet thick.

Senator KITTREDGE. Why did you not construct that dam of earth?

Mr. STEARNS. An earth dam would not be appropriate, in the first place, because the spillway could not be kept away from the dam; and then it was a particularly appropriate place. I think, in which to build a masonry dam, as a second reason.

Senator KITTREDGE. When I was there I was told that the foundation was carried to bed rock. Is that true?

Mr. STEARNS. It was carried to bed rock; and then we excavated into the bed rock until we got a rock nearly free from seams.

Senator KITTREDGE. Why did you do that?

Mr. STEARNS. Why carry it to the rock?

Senator KITTREDGE. Yes.

Mr. STEARNS. Because a masonry dam should be founded upon rock.

Senator KITTREDGE. Was the character of the earth sufficiently stable to support a masonry dam?

Mr. STEARNS. I should say not.

Senator KITTREDGE. What is the character of the material there?

Mr. STEARNS. The greater part of it was a loose gravel. It was really very much mixed up. Some of it was fine sand. Then, on one side of the valley, there was a boulder clay, and on the other side, up the slopes, sand and gravel, loose.

Senator KITTREDGE. I noticed that you had some large earth dams there.

Mr. STEARNS. One of the large earth dams—if you have been along on the railroad—which was relocated is the dike that I speak of, which is similar to this. It will have water against it to a depth of 65 feet, and instead of being half a mile through it is a third of a mile through.

I might have called attention to one other thing, as to the similarity between that so-called dike or earth dam and this Gatun dam—that it is 2 miles long, while this is a mile and a half. The deepest boring there went down 289 feet, while the deepest boring here went down 258 feet.

Senator KITTREDGE. What are the foundations for that dam?

Mr. STEARNS. The different portions of it are built in different ways. In some parts there was a porous sand or gravel overlying the rock, and the rock was not far down. In those cases a trench was dug down to the rock. The rock was carefully plastered, and little walls were built on it to prevent the water from following along the rock. Then the excavation, which was somewhat like a railroad cut, was filled in with the surface soil stripped from the reservoir. We took that surface soil because it had the fine material in it and was not porous and because we wished to remove it from the reservoir to improve the quality of the water.

In other parts, where excavation could not be made to the rock, there was a deep cutting made, again like a railroad excavation or railroad cut, and sheet piling was driven in the bottom to cut off possible seepage through veins of sand that were not so fine as to be classed as impermeable. Then there was still another part of it and the highest part, where all that was done was to strip off the surface material, take out the stumps, and the fine material was laid right on the fine material underneath, precisely as is proposed here at Gatun.

Senator KITTREDGE. What is the height of the dam at the points you last mentioned?

Mr. STEARNS. There is 65 feet of water against it.

Senator KITTREDGE. And what do you mean by sheet piling?

Mr. STEARNS. Sheet piling consists, in this particular case, of three thicknesses of plank nailed together so that the center one would protrude beyond the planks on each side, making what is called a tongue, and at the other side of the pile there was a recess made by letting the middle plank set in, making a groove; and these planks were driven down into the ground, the tongue of one fitting into the groove in another, so as to make a continuous and approximately water-tight line of timber.

Senator KITTREDGE. What was the purpose of driving those piles?

Mr. STEARNS. It was, as I have already stated, because the excavation was not carried down to the wholly impermeable material, and as a safeguard this sheet piling was driven, perhaps on an average about 50 feet farther, to help cut off the flow of water under the dam.

The question of whether there should be sheet piling or not was dependent upon the character of the material found by the borings, and about one-third the length of the dam no sheet piling was needed, and the fine material rested directly on the fine material.

I will leave with you a pamphlet entitled "The Bohio Dam," by George S. Morrison, past president of the American Society of Civil Engineers. In it is a description of this north dike, by myself, with illustrations. Opposite page 264 there is shown an excavation, such as I have referred to, with the sheet piling in process of driving. This excavation was 60 feet deep. Opposite page 266 there is shown another view of the driving of sheet piling, and also a large-scale view of the bottom of the sheet piling, as it was being driven, with a water jet.

Opposite page 268 will be found a case where the trench was excavated to the rock and the rock is prepared to receive the fine material used for filling the trench. Still another cut shows the fine material in process of being placed in the trench.

Senator KITTREDGE. What is the height of the dam above the surface, above the point at which you went to solid rock?

Mr. STEARNS. It is variable, but I should say about 30 feet, as a rule. In some cases it was only 2 feet or 5 feet. It varied from practically nothing to 30 feet.

Senator KITTREDGE. To what extent did you make borings under the foundation of your earth dam at Wachusett?

Mr. STEARNS. In order to locate the dam at the place where the most impermeable material might be found, and to guide in its construction, there were made a very large number of borings. I do not recall how many, but I think the aggregate depth was something like 30 miles of borings.

Senator KITTREDGE. In what distance?

Mr. STEARNS. In 2 miles length of dam.

Senator KITTREDGE. And how far apart were the borings?

Mr. STEARNS. They were at first laid out in squares 200 feet apart over a very large territory, half a mile to three-quarters of a mile wide and 2 miles long. Then, having determined approximately the line of the dike, they were made about 1 foot apart; and then, to get to greater refinement immediately along the line of the dike, they were made 25 feet apart in squares.

Senator KITTREDGE. So that before you commenced the construction of that dam you made borings not exceeding 25 feet apart? Is that right?

Mr. STEARNS. In the vicinity of the dam; yes.

Senator KITTREDGE. In the foundation and its vicinity?

Mr. STEARNS. Yes. There was a special reason for that, I should say.

Senator KITTREDGE. I would be glad to hear that.

Mr. STEARNS. That the material was variable, and it was desirable to pick out the very finest material; while at the Gatun dam the material is homogeneous to a large extent; that is, it has been brought by a sudden process, which made it very much alike from one place to another in the distance of a mile and a half.

Senator TALIAFERRO. Can you ascertain that fact otherwise than by borings?

Mr. STEARNS. That it is homogeneous?

Senator TALIAFERRO. Yes.

Mr. STEARNS. I should say by borings together with a general study of what has been going on there; but mainly by borings, which seem to prove, by the entire absence of bowlders and gravel, that the material that has been deposited in that vicinity has been fine material; and fine material is impervious. I felt nearly as well satisfied that that was the case from the first set of borings as I did after the borings had been made directly across on the line of the dam, because there was hardly an exception to the rule in any one boring.

Unless there are more questions to ask, I will take up an entirely different subject.

The CHAIRMAN. Just proceed, Mr. Stearns.

Mr. STEARNS. There is one thing that may have been figured by your committee, or perhaps somebody else has presented it. It is the interest during construction on the lock and the sea-level canals. It is not customary to put the interest during construction into an estimate made by an engineer. He gives an estimate of the cost of the work, and I think it is generally the rule that appropriations are made of a certain amount of money to be expended on the work, and the interest appropriation is made separately.

I do not know how it may be in this case; but I think there is no question in anybody's mind that the cost of a work includes the interest during the period of construction, when the work itself is not in use.

I made figures for the sea-level canal and the lock canal on these bases:

I assumed in both cases that \$50,000,000 had been paid out in 1904. That, of course, is to the Republic of Panama and the New Panama Canal Company. Then, in the case of the lock canal, I assumed that it would take nine years for construction from 1906; and for the expenditures in 1905 I allowed \$14,000,000, and \$14,000,000 in each of the succeeding years.

For the sea-level canal I assumed the expenditure in 1905 as \$14,500,000, and \$15,500,000 in each of the next fifteen years. That makes the total as given by the majority of the Board of Consulting Engineers.

On that basis the interest on the sea-level canal, if completed in fifteen years (and that is the estimate of the minority, that it would not be completed in less than six years after the lock canal) would be \$66,297,000.

Senator DRYDEN. At what rate of interest?

Mr. STEARNS. Two per cent. I neglected to state that.

The interest on the lock canal, if completed in nine years, would be \$28,502,000. The difference in favor of the lock canal on these assumptions is \$37,795,000.

The CHAIRMAN. That is the interest during construction?

Mr. STEARNS. Yes; that is the difference between the two plans.

The CHAIRMAN. Yes.

Mr. STEARNS. Now, if the time for constructing the sea-level canal should extend to eighteen years the interest account would amount to \$88,532,000. Deduct, as before, the interest on the lock canal, \$28,502,000, and the difference in favor of the lock canal is \$60,030,000.

The cost of the lock canal, including interest and the payments to the Panama Canal Company and to the Republic of Panama, would be \$219,000,000. The grand total of similar payments in the case of the sea-level canal, using the cost as estimated by the Board of Consulting Engineers, and assuming fifteen years for completion, would be \$363,000,000; and the cost of the sea-level canal, including some items based upon the cost as estimated by the Isthmian Canal Commission, and assuming eighteen years for completion, would be \$410,000,000.

I think that has considerable weight in the type of canal that should be adopted.

The CHAIRMAN. If you will hand that statement to the stenographer, it will be printed.

(The statement referred to is as follows:)

RELATIVE AMOUNT OF INTEREST DURING CONSTRUCTION ON LOCK AND
SEA-LEVEL CANALS.

In both cases assume that the interest is at 2 per cent, compounded annually.

Assume in both cases an expenditure of \$50,000,000 in 1904.

In the case of the lock canal assume a total expenditure for the ten years from 1905 to 1915, inclusive, of \$14,000,000 per year, making a total of \$140,000,000 for construction.

For the sea-level canal assume the expenditure of \$14,500,000 in 1904 and of \$15,500,000 in each of the next fifteen years, making a total of \$247,000,000 for construction.

Interest on sea-level canal if completed in fifteen years-----	\$66, 297, 000
Interest on lock canal if completed in nine years-----	28, 502, 000
Difference in favor of lock canal-----	<u>37, 795, 000</u>
If the time for constructing the sea-level canal should extend to eighteen years, the interest account would amount to-----	88, 532, 000
Deduct, as before, interest on lock canal-----	<u>28, 502, 000</u>
Difference in favor of lock canal-----	60, 030, 000
The cost of the lock canal, including interest and payments to the Panama Canal Company and the Republic of Panama, would be-----	219, 000, 000
The cost of the sea-level canal, including interest and the above payments, based upon the cost as estimated by the Board of Consulting Engineers, and fifteen years for completion, would be -----	363, 000, 000
The cost of the sea-level canal, including interest and the above payments, based upon the cost as estimated by the Isthmian Canal Commission, and eighteen years for completion, would be -----	410, 000, 000

Senator ANKENY. Mr. Stearns, have you prepared a relative estimate there showing a comparison of the sea-level and the lock canal in regard to maintenance?

Mr. STEARNS. I have; yes. I will take that up next. I will say that I have not actually made the figures, but I will take up some of the statements that have been made as affecting the maintenance of the two canals to show, I believe, that they are not in any way warranted.

The lock canal will have only three places where a force of attendants will be required—namely, the locks and dam at Gatun, making one place; the locks at Pedro Miguel, and the locks at Sosa; also the waste way at Sosa, which is not far away from the locks.

The sea-level canal will have about nine such places—namely, the Sosa locks, the seven meeting places (they are not shown in the plan of the majority, but I think it is understood that they are needed, and they are placed about 5 miles apart), and the Gamboa dam and power plant.

The force required at the locks will undoubtedly be larger, of course, than the force required at the meeting places. Do I make myself clear as to the meeting places? Has that matter been discussed here?

Senator KITTREDGE. Yes.

The CHAIRMAN. I think we understand that, sir.

Mr. STEARNS. But at those meeting places there will have to be probably three shifts of men, and enough men to take the lines as they are passed out from the ships as they come along. The force at the locks—I am not so familiar with that work as are other members of the minority, but there has to be the force to take the lines as they are passed out as the ship comes up to the pier there, just as it would come up to the pier at the meeting places. Then there has to be the force for operating the gates and the power plant, but the power-plant force would be no greater than that at the Gamboa dam, I presume.

The total force required for operation would be larger on the lock canal I have no doubt, but it would be very largely offset by the greater number of places in the sea-level canal.

The other big item is dredging.

It is unnecessary to discuss the dredging in the harbors, because that would be the same in each case and would not enter into the comparison; and it is the dredging, then, practically between the shore lines on the two sides that needs to be considered. -

In some of the testimony there is a very surprising statement which has been made, tending to show that in the case of a lock-canal plan the silt brought down by the upper Chagres will not deposit in the portion of the Gatun Lake above Gamboa, but will pass through this portion of the lake, and then the greater part of it will be dropped in the channel of the canal all the way down to Tavernilla. This statement is to be found on page 1570 of the testimony.

Senator KITTREDGE. That is Mr. Burr's statement, is it not?

Mr. STEARNS. Yes.

The portion of the lake to which I refer is this portion from the extreme upper end down to Gamboa. There comes into this portion of the lake the Chagres River at its upper end and also a number of tributary streams.

When we were on the Isthmus there was furnished to us a table, which is shown in this blueprint, which gives the number of cubic feet of water in the reservoir above Gamboa at different levels. It is given for elevation 80 and for elevation 90, and to get elevation 85 I have averaged those two amounts.

The size of that reservoir is 4.94 square miles, and it holds 1,905,000,000 cubic feet of water, equal to 70,500,000 cubic yards.

The flow of the Chagres, as given by General Abbot, averages for the year about 3,200 cubic feet a second; for the rainy months of the year about 4,000 cubic feet per second; in high freshets, such as occur in most years, it would reach 25,000 cubic feet a second. In still greater freshets, which occur perhaps once in three years, it may reach 50,000 cubic feet a second; and in phenomenal freshets it would go up higher, possibly to 75,000, or perhaps higher than that.

It is a subject of easy computation, knowing those quantities of water coming into the lake, to ascertain how long it would take to push the water in the lake out ahead of that coming in, provided it were all pushed out. And I find that, taking the average rate of flow for the year, the water would be pushed out in one hundred and seventy-six hours. At the average rate for the rainy months it would be pushed out in one hundred and thirty-two hours. In the case of high freshets, in twenty-one hours. In the case of the still

higher freshets that I have mentioned, in ten and one-half hours; and in the case of a phenomenal freshet there would be seven hours required for the crowding out of that water.

Senator KITTREDGE. Under what plan?

Mr. STEARNS. The lock plan.

There is also susceptible of computation, knowing the length of time, the number of hours, required to go 6 miles from the upper end of the lake to Gamboa, to determine what the average rate of flow is; and that figures out, taking the average rate for the year, at three one-hundredths of a mile an hour. The average rate for the rainy months is five one-hundredths of a mile an hour. During high freshets it would be twenty-nine one-hundredths of a mile an hour.

In anything further I have to give you you will have to remember that it only comes at intervals of years. Even then, with the still higher freshets, it would be fifty-seven one-hundredths of a mile an hour and with phenomenal freshets eighty-six one-hundredths of a mile an hour—that is, even the extreme conditions there would not produce an average velocity, if all the water were pushed out ahead of the water coming up, as much as a mile an hour; and that is the freshet of once in fifty years, which does not need to be counted at all.

The statement has been made that the water coming in at the upper end would find its way through this lake, following the line of the present river, with all its crooks, and consequently would bring the silt down and distribute it down to Tavernilla and leave, I suppose, the clean water on the sides in the lake. That is based on observations which are quite frequently made when rivers overflow their banks in case of freshet, and the water, for instance, in a river that has a height of 10 feet to its banks overflows to a depth of 2 or 3 feet, only a small proportion of the depth. On the Mississippi River it might be a case of overflowing 10 feet where the depth from the banks down to the river is, say, 50 feet—that is, the river will control the rapid current when there is only a slight rise above the top of its banks.

But in this case the river up to its banks is more nearly 10 feet and the amount that the water is raised above it is 20 to 30 feet. So that the flow will not be governed by a channel which is submerged to so great a depth and is comparatively insignificant.

I know that would be the case, because I made a study of that matter last September, making cross sections at various places; and the channels that are now there are insignificant and would not guide the course of the current to a great extent.

On the other hand, there are some bays in here which would not furnish their full effect in depositing the silt; but it is beyond all question that the silt will properly deposit in the portion of the lake above Gamboa. In that part of the lake will be deposited all of the gravel, all of the sand, and all of the fine silt, except, possibly, that in case of freshets some slightly discolored water will go beyond. But it means that practically none of that will ever get into the canal.

It is equally true that we have these other streams coming in. This is a very small sketch plan. You can see that the distance of one mile is the distance between those dots; and these smaller streams come in sometimes 2 miles away, sometimes a mile, and I think there is only one case within half a mile, except in the case of the Obispo, which comes in a short distance below Gamboa.

In that case it was the plan of the minority to build an embankment parallel to the canal down to an island that is shown between mile 29 and mile 30; and then there would be an estuary more than a mile long, in which the silt from the Obispo could be deposited. That embankment is not included in the estimates, because it was not thought that it would cost anything. The water would be of the same height on each side of it, so it is not a dam; and it was thought that the material from the Culebra cut could be deposited there without any extra cost.

Senator KITTREDGE. Would it be in the nature of a breakwater?

Mr. STEARNS. There would be no waves to affect it. It is a dividing embankment, which may be of fine rock or almost anything sufficient to prevent any great current of water passing through into the canal, and forcing the flow of the Obispo to come in a mile below where it would naturally come in if the embankment were not placed there.

I think it is absolutely fair to say that no dredging whatever would be required on the lake portions of the lock-canal plan.

I will call attention to the other side of the case, as stated in the testimony of Professor Burr, on page 1504. He says:

"The smaller streams—and there are quite a number of them, but all very small—would be taken directly into the volume of the canal in the ordinary way, quite an ordinary procedure in canal construction, but instead of pouring directly into the prism of the canal they would first pass through a basin built on one side of the canal prism, so that any sediment which they might bring down in floods would be held there, and the water would flow over a weir into the canal."

Do I make it clear? This is the sea-level canal now [reading]:

"In that way no sediment whatever from the Chagres River or from any of its tributary streams would be brought into the canal. It would be entirely kept out, and it would also be kept out of the canal on the Pacific side from the small streams—because they are only small streams on that side—in a precisely similar way."

The testimony goes on with a question from Senator Morgan:

"So that the water would find its way into the canal, but the sediment would be left behind in these basins?"

"Mr. BURR. The sediment would be left behind in these basins."

In the first place, the report of the majority did not provide any basins in which the sediment could be deposited.

Senator KITTREDGE. Is that an expensive proposition?

Mr. STEARNS. May I go on and come to that matter later?

Senator KITTREDGE. Certainly.

Mr. STEARNS. The report of the majority is this:

"The tributary streams, whose beds at point of junction with the canal are considerably above the prism of the latter, will be discharged over masonry-stepped aprons or through metallic discharge pipes, or these beds will be sloped and lowered so as to prevent objectionable currents at junction points. The means for the accomplishment of these results are such as are in common use on nearly all important canals.

"During three-fourths of the time these streams discharge an insignificant amount of clear water. When they are in flood they will bring down some silt, and it is recognized that the maintenance of the navigable canal channel will require a small amount of dredging."

Now I will answer the question which has been asked as to whether these basins would be expensive.

The testimony is to the effect that a basin containing 70,000,000 cubic yards of water above Gamboa is insufficient for these streams that enter above that point, including the Chagres River. The small streams, so called, which enter below, bring in, in the aggregate, considerable water. General Abbot, in papers which he has written on the hydraulics of the Panama Canal (see the report of the Board of Consulting Engineers, p. 187), has determined that the flow past Gamboa is 65 per cent of the flow at Bohio. That is, if this is 65 per cent coming in here then there is 35 per cent of the total quantity at Bohio coming in from these tributary streams. That is, half as much water comes in between Gamboa and Bohio from those streams as comes in above. But the majority have provided for turning part of this water away by reversing the flow of the streams so that the quantity would be considerably smaller.

The basins ought to have as large a size in proportion to the flow of these streams as this portion of Gatun Lake in proportion to the streams entering there. To give them that size, they should contain about 22,000,000 cubic yards of water. But these come in quite high above the sea-level canal; and to provide 22,000,000 cubic yards of water space in those basins would require the excavation of more than 22,000,000 cubic yards of earth. For instance, if a basin is required for the Obispo, which is one of the large streams coming in close by the canal, that is all rock at that place. I do not see how a basin could be built which would be proportionately large to this one above Gamboa, except by the excavation of a great amount of rock there, or by building another one of the dams.

Probably the basins could be formed more easily by the building of dams than in any other way—by increasing the number of dams on the sea-level plan. If that dam were built at present, it is needless to say, perhaps, that it would flood the Panama Railroad. But it is not a small thing. It would go up into the millions of dollars to attempt to provide as good a settling basin as is provided by the upper end of Gatun Lake; and that is said by the majority—

Senator KITTREDGE. You do not mean Gatun Lake, do you?

Mr. STEARNS. Yes, sir.

Senator KITTREDGE. Oh! Under the lock plan?

Mr. STEARNS. Under the lock plan. I am comparing the two plans. The lock plan has this great receptacle for silt; and to produce artificially receptacles for silt for the streams coming into the sea-level plan would require many millions of dollars. And yet the statement is made here in the testimony that the silt from here would come down and go into the lock canal, while not a particle of sediment would get into the sea-level canal.

The fact that sediment would get into the sea-level canal—for, practically, it is impossible to keep it out—means that there would be dredging. With a canal having a depth of only 40 feet, and especially where the bottom is in rock, if that depth is to be maintained at nearly 40 feet, it would mean cleaning the material off as soon as it had gathered to the depth of 1 or 2 feet, say, and would reduce the depth to 38 feet immediately above the surface of the rock, which would be very expensive. That is, a canal in rock that is going to

have silt come into it ought to be excavated to a greater depth than 40 feet.

I have not made any figures to cover the case, but it would seem to me that the dredging on the sea-level canal would be a large item; and I think it can be proved by the detailed figures such as I have given, and not by an engineering guess, that the material would all deposit in the case of the lock-canal plan.

Those are the items that make up the bulk of the maintenance. Of course there is the government of the Zone and other things that are equal in both cases.

Senator DRYDEN. You have not allowed in this statement anything for the interest on the difference in the capital cost of the two plans?

Mr. STEARNS. Not in this statement. If that were allowed the capital cost of the two plans should be made including interest during construction, which would make a much wider difference in the cost between the two than the mere work of construction, and that is easily figured by anybody who wishes to do it.

Senator DRYDEN. That would be a permanent difference, of course?

Mr. STEARNS. It would.

Senator HOPKINS. Have you reduced to figures the difference in cost of maintenance of the two types of canal?

Mr. STEARNS. No; but my judgment is, as far as judgment is worth anything—my engineering guess is that it would cost as much to maintain the sea-level canal as the lock canal.

The CHAIRMAN. Mr. Stearns, have you any statement to make in reference to the other dams on the lock plan?

Mr. STEARNS. I think they are governed practically by the same laws and rules as the one that I have described in so great detail. The material under the La Boca dam I think is even more impervious, although we have not as many borings. It may be more muddy. That was anticipated; and the dam on its upstream side was carried out a long distance in this direction [indicating] so that there would be enough weight on this material lying outside of what would be the natural shape of the dam to prevent the mass of the dam from crumbling down into the material and causing a flow. I do not think there is as much sand over there, and sand is the element that produces friction and prevents a flowing of the material under heavy weight. There is no question about the ability to so load any such material as that that it will not flow when displaced.

At the other sites the rock is very near the surface. At the Ancon-Corozal dam I think our borings showed in no case rock more than 4 or 5 feet down, although they were not sufficiently frequent to show that it might not be deeper at other places.

Testimony has been given with regard to the future transformation of a lock canal into a sea-level canal, and it is not in accordance with the report of the majority or the action of the whole Board of Consulting Engineers. I do not know just where to find the testimony, but I think it has been given, that if a canal were built as a lock canal it would never be transformed to a sea-level canal.

Senator KITTREDGE. Do you favor that?

Mr. STEARNS. I think it will be done some time.

Senator KITTREDGE. Do you favor it?

Mr. STEARNS. The question is too indefinite for me to answer yes or no. I think I will explain so fully that my proposition will be clear.

My belief is this: That by building a lock canal at the present time the United States is not precluded from having a sea-level canal at some future time.

Senator ANKENY. Would it not be very expensive to transform a lock canal into a sea-level canal eventually?

Mr. STEARNS. Yes; but I think there might be a great difference in opinion as to the time when that "eventually" is coming. Mr. Bunau-Varilla, who came before us, suggested that that was the proper way to get a sea-level canal very soon in the near future, and the Board of Consulting Engineers did not agree with that view, because they thought a sea-level canal transformed from a lock canal would cost more than a sea-level canal built immediately.

Senator TALIAFERRO. That is true, is it not?

Mr. STEARNS. That is true.

I would like to read you the statements which are made here in the report of the majority, and which are fully concurred in by the minority. They are as follows:

"1. That it is possible to turn any lock canal which it [the Board] has considered into a sea-level canal without interrupting the traffic upon it."

That it is possible to do it.

Senator HOPKINS. That is the judgment of the entire Board?

Mr. STEARNS. Of the entire Board.

I will omit the second one, which says that it is not financially possible to do it now, which we all agreed to. [Reading:]

"3. That if a sea-level canal is to be constructed in the near future it should be built directly, without first building a lock canal."

We were all agreed upon that—that if a sea-level canal is wanted in the near future, it should be built without building a lock canal first.

"4. That the date for developing a sea-level from an existing lock canal would be so remote, and that there would be so little difference in the time and cost of the transformation for different types of lock canals with a common summit level, that the design of a lock canal should not be controlled by the view that it is subsequently to be so transformed."

The view that I hold was very well expressed by one member of the majority of the Board, when he said that he thought it could be done; and we all agreed to that. He said: "When it is desired the financial difficulty will have disappeared."

The lock canal is estimated by the minority to be capable of taking care of a traffic of 80,000,000 tons a year. I think the price per ton on the Suez Canal is at least a dollar.

General DAVIS. It is 7½ francs now.

Mr. STEARNS. That would be a dollar and a half. Eighty million tons—or, let me say, 60,000,000 tons, instead—would represent \$90,000,000 a year of revenue. If \$90,000,000 a year of revenue were being obtained from that canal, the question of whether it cost another year's revenue or two years' revenue would not be of importance. Fifty or seventy-five years from now, if a sea-level canal is wanted, there is no reason why it should not be constructed; and I think the

statements that I have read show that that is the judgment of the entire Board, although statements have been made to the contrary here.

Senator ANKENY. Do I understand, Mr. Stearns, that the transformation can be carried out without interfering with the traffic on the canal? Is that what you have decided?

Mr. STEARNS. That is the judgment.

Senator ANKENY. Of the engineers?

Mr. STEARNS. Of the engineers. But let me say this: That as a step in the transformation, under the plans that are now proposed, I have no doubt that additional locks would be built. At least two locks at Gatun out of the three would be built anew with reference to the transformation; so that there would be three locks for use before the transformation had proceeded very far, so that when working in one there would be two for traffic.

But the additional locks probably would not mean, throughout the whole length of the canal, more than an additional \$25,000,000; and looking to the time when I have suggested that this is to be done—that is, when the traffic gets up to sixty or seventy million tons a year—it will be entirely unimportant whether it costs an extra \$25,000,000 or not.

Senator ANKENY. But I understand that your conclusion was that this transformation might take place and be completed without disturbing the traffic on the lock canal?

Mr. STEARNS. Yes; that is the unanimous opinion of the Board.

Senator DRYDEN. You have no doubt read the testimony of one engineer here, who, in giving his opinion, gives one directly and diametrically opposed to yours upon this point?

Mr. STEARNS. Yes.

Senator DRYDEN. He has testified, in effect, that if we built a lock canal now, we shall always have a lock canal; that while it might be physically possible to transform a lock canal into a sea-level canal, the price would be prohibitive.

Mr. STEARNS. I do disagree with that entirely; because, as I have stated, if a traffic is reached equal to 60,000,000 tons, and that is the occasion for transformation—that they want to accommodate more traffic than can well be carried through a lock canal—it seems to me that money would be no object. It seems clear that that would be the case, with \$90,000,000 a year earnings; and that is what it would be at the rate of \$1.50 a ton.

Senator DRYDEN. Have you made any figures as to the cost of transforming a lock canal into a sea-level canal?

Mr. STEARNS. Yes. It was estimated that one could be transformed from the 85-foot level proposed for the lock canal to a sea-level canal that was 150 feet wide for \$208,000,000. Now, it seems to me absolutely certain that that would not be done, because it would transform it into a canal that was not as good for traffic as the lock canal. But we also made figures as to what it would cost to transform it into a sea-level canal 300 feet in width.

Senator KITTREDGE. Do you mean at the surface of the water or at the bottom?

Mr. STEARNS. At the bottom. I think I have not the figures with me—are they in the report?

General DAVIS. No; they are not in that book; they are in those detached memoranda or records.

Mr. STEARNS. I should say, from having rather an uncertain memory on that particular point, that it was about \$340,000,000.

General DAVIS. Yes; it was somewhere in that neighborhood. That is about right.

Senator KITTREDGE. Why not build the sea-level canal now?

Mr. STEARNS. To build it to that width, which would make it better than a lock canal, would require not only this \$247,000,000 that is estimated, but, according to the estimates of the Isthmian Canal Commission, another \$87,000,000, and take many more years.

Senator KITTREDGE. Are the only objections you have to a sea-level canal the matters of time and money?

Mr. STEARNS. I will have to qualify my answer by saying that I think a sea-level canal if made from 300 to 400 feet wide would be far preferable to a lock canal—assuming, of course, that due care was taken to keep the silt and tributary streams in such a condition that they would not interfere with the operation of the canal.

Senator KITTREDGE. That could be done, could it not?

Mr. STEARNS. I think it can be done. It is only a question of money and time.

Senator TALIAFERRO. Do you think, Mr. Stearns, that a sea-level canal of the width of 300 feet could be built there for \$87,000,000 more than the estimate of the Board for the 150 or 200 foot canal?

Mr. STEARNS. I have no information upon that point that is at all definite except the statement of the Isthmian Canal Commission.

Senator TALIAFERRO. Have you looked into that question at all?

Mr. STEARNS. Not enough to give an opinion.

Senator TALIAFERRO. Did the Board look into it in considering the type of the canal?

General DAVIS. Only to the extent you speak of in regard to the transformation.

Senator SIMMONS. How long would it take to build a 300-foot sea-level canal, Mr. Stearns?

Mr. STEARNS. There is one way of getting a rough estimate of the time required to build the canal, and that is by the amount of money that can be practically expended in a year. I found that \$15,500,000 would have been expended in a year for a sea-level canal completed in fifteen years. At that same rate, from five to six years additional would be required to spend an additional \$87,000,000. That is rather a crude estimate, but it would not be so very far from the truth.

Senator TALIAFERRO. So you have a way, Mr. Stearns, of estimating the time, but no way of estimating the amount?

Mr. STEARNS. Do you mean the amount in dollars?

Senator TALIAFERRO. I say you have a means of estimating the additional time that would be required to construct this 300-foot canal, but you have no means of estimating the additional cost of such a canal?

Mr. STEARNS. I have stated that the Isthmian Canal Commission has given an estimate of the cost which seems to me reasonable, I will say; but I have made no figures, so that I can not tell exactly.

Senator ANKENY. Has it not been considered that this widening of the sea-level canal might go on without interruption of traffic?

Say that it was built upon plans that appear in the majority report. Assuming that it is constructed on a basis of 150 feet, might it not be widened to 300 feet without disturbing the traffic that might go on in a 150-foot canal? In other words, those betterments might go on without disturbing the traffic in the the first proposition?

Mr. STEARNS. I think they could to some extent—that is, where the material was sand and gravel that could be dredged; and especially toward the ends of the canal, that could be dredged and taken out to sea quite readily. In the Culebra cut, to carry that widening process at all fast with the sea-level canal and traffic through it would be troublesome. If many scows or barges were employed to carry the material, it would interfere considerably with the traffic through so narrow a canal. Of course it could be done in the dry above water level. I think it could be done.

Senator ANKENY. Without disturbing the traffic?

Mr. STEARNS. Well, I do not think it could be done entirely without disturbing the traffic.

Senator ANKENY. I mean materially.

Mr. STEARNS. But without very seriously disturbing it.

Senator HOPKINS. Can a lock canal be transformed into a sea-level canal without disturbing the traffic seriously?

Mr. STEARNS. I should think it could; and I had better give my reason, I presume.

Senator HOPKINS. Yes.

Mr. STEARNS. The portion to be widened from 200 feet to a greater width at the Culebra cut is only 4.7 miles long. That would not require the removal of nearly as much material, and the barges could be towed down into Gatun Lake, and as soon as they got into the wide channel—500 feet wide—they would not interfere with navigation. Moreover, the lake is deep enough so that barges, with their small draft, could go almost anywhere in it. They could be taken to places—and there are many of them—in the bays where the material could be dumped, making quite a short haul for the material that would come from the Culebra cut. There are places down there where a large amount of material could be dumped. It would be more convenient than taking it away out, as in the sea-level canal, to the sea; and if it is not taken out to the sea any material that is dredged or taken below the water level will have to be hoisted up in some way to where it will not run back into the canal.

Senator HOPKINS. I do not want to interfere with your plan of developing your ideas on the subject of the two different types of canal, but before you get through with your statement, Mr. Stearns, I would like to have you go back to the Gatun dam and speak of the locks there. The contention has been made that there is not room enough there to establish a flight of three locks, and I want to hear from you fully on that subject before you get through. I do not want to interrupt you.

Mr. STEARNS. I will state it now; it is just as well as at any other time. I saw the draftsman at the Panama Canal Commission—

Senator HOPKINS. Before you make that statement, let me ask this question: The plan that is proposed by the minority provides for a flight of three locks of 900 feet each, I think?

Mr. STEARNS. Yes; 900 feet of usable length.

Senator HOPKINS. Yes; usable length. Now, the statement was made by Mr. Bates, and I think some others, that the space is not sufficient to provide for locks of that character.

Mr. STEARNS. The statement probably arose from a draftsman's error in this plan of the Gatun dam, where the locks are shown shorter than 900 feet of usable length.

Senator HOPKINS. Now, what paper is that? I ask so that it can be identified by the reporter.

Mr. STEARNS. Plate 11. The estimates were all made upon a large scale drawing which I saw this morning, and that large scale drawing shows locks with a usable length of 900 feet.

If this plan had been correctly drawn, these locks would have been lengthened by an amount which I do not exactly remember, but which I should say was about 200 feet. The borings show that those locks could be moved upstream not less than 300 feet if desired, and still have a rock foundation for the locks themselves, but not for the approach wall. The approach wall, as shown on this plan, does not have a rock foundation, and there is no chance whatever for it. It was never contemplated.

That approach wall was to be built on material filled out as a foundation, according to our plans, and on that was to be placed a timber crib which can rest on a foundation which is not absolutely solid; and on the top of the timber crib was to be a concrete capping. It is just the same kind of construction that is used at the Soo Canal. There is also room for moving the lock farther on the downstream end. There is no question whatever, so far as we know, as to the feasibility of building locks of the length contemplated.

Senator KITTREDGE. What do you mean by that—"so far as you know?" Do you not know all about the foundational conditions there?

Mr. STEARNS. The borings at the Isthmus were made in connection with a plan which is somewhat different from the one now proposed. It was a plan for two locks, and they were located in a different position. As a result, we have not borings at the lower end of the lock, but there are borings near by.

Senator KITTREDGE. How near?

Mr. STEARNS. The nearest one is about 150 feet from the lock wall, and I should say about 700 feet above the lower end of the lock. The greater number of those borings showed quite generally a depth of from 20 to 30 feet down to the indurated clay. They were so uniform that Mr. Maltby in the letter made the statement that "the clay seems to be found here about 20 or 30 feet below the surface." The excavation toward the lower end of the lock will necessarily be 85 feet deep; and there is hardly a question but that indurated clay will be found far above that level, so that the lock can be placed upon the indurated clay. We did not have, in the short time at our disposal, an opportunity to settle every detail point, but there seemed to be no reason to doubt that additional borings would show that that was all right. It certainly shows by the high ground there that it is not alluvial material.

Senator KITTREDGE. Are there any reasons in favor of the proposition which you can suggest?

Mr. STEARNS. In favor of the statement that indurated clay would be found?

Senator KITTREDGE. That you can go down there and get a satisfactory foundation?

Mr. STEARNS. Why, I think so. The fact that borings along there showed similar results would indicate that very strongly—that is, since they showed that the indurated clay was within 20 or 30 feet of the surface, we are quite certain that it would be found certainly within 80 feet.

There is one point here, outside of the line of the lock, however, where a boring went down to a great depth; and it might be found that the clay would be deeper at some point where the lock is situated. I do not think that would be fatal with regard to this lower lock. I am now consulting engineer on a work where a tidal lock is being built on piles. I do not think I should want to suggest piles for this plan, but I have no doubt—

Senator KITTREDGE. How many cubic yards of masonry go into the lock structure? It is 3,000,000, is it not?

Mr. STEARNS. I think very likely; I should think it might be 3,000,000 in all the locks the whole length of the canal.

Senator KITTREDGE. That would require a good solid foundation?

Mr. STEARNS. The solidity of the foundation would depend upon the height of the walls at that particular place.

Senator KITTREDGE. You would have to have a good foundation all along the lock structure, would you not?

Mr. STEARNS. Certainly.

Senator KITTREDGE. In order to have a good foundation you would have to have it go all the way along, would you not?

Mr. STEARNS. Yes. It is more important to have a very resistant foundation in some places where the walls are high than in other places where they are lower. Some difference could be admitted.

Senator KITTREDGE. In the operation of these heavy gates and machinery you would require absolutely solid, firm foundations, would you not?

Mr. STEARNS. You must indeed have them; the thing must remain immovable.

Senator KITTREDGE. Absolutely immovable?

Mr. STEARNS. Yes; but the pile foundation that I am speaking of in connection with a lock that is being built on work that I am now connected with is also an absolutely immovable foundation for that lock.

Senator KITTREDGE. What is the size of the lock to which you now refer?

Mr. STEARNS. This is about 350 feet long, 45 feet wide, and has a depth of 16 feet at low tide.

Senator KITTREDGE. Can that properly be compared with the lock at the Gatun structure?

Mr. STEARNS. It is not nearly as heavy.

Senator KITTREDGE. What is the difference between them in weight?

Mr. STEARNS. I could hardly guess at that.

Senator KITTREDGE. What is the difference in cubic yards necessary to construct the locks and the necessary structure connected with them?

Mr. STEARNS. I do not think the cubic yards have anything to do with it, because that spreads over a great length of territory. The

question, as I have already said, is one of height of walls, and I do not know those figures well enough to tell you.

Senator KITTREDGE. What is the weight of the gates?

Mr. STEARNS. I do not know; I did not figure those at all.

Senator KITTREDGE. What is the weight of the machinery necessary to operate the gates?

Mr. STEARNS. I do not know. That was the part that I was not calculating upon.

Senator TALIAFERRO. Speaking of those borings at the Gatun dam, Mr. Stearns, at what depth did I understand you to say water flowed up through the pipes?

Mr. STEARNS. At the point of most considerable flow, where it came up through a 2-inch or a 2½-inch pipe and flowed over the top to a depth of an inch and three-quarters, that water came from more than 200 feet below the sea level, and the top of the pipe at that time was probably not less than 10 feet above sea level.

Senator TALIAFERRO. Did the borings show water at different depths as they went down?

Mr. STEARNS. That material is saturated from top to bottom. It is down below sea level; it could not help being, and there was a small flow, where the water just trickled over the sides of the pipe, at several points. They are all noted on that blueprint. I think there was shown to be about a quarter of an inch of depth of flow over the pipe as it rose. Do you catch my meaning?

Senator TALIAFERRO. Yes.

Mr. STEARNS. The water flows up from the pipe, and then goes over, and they measured the amount by the depth on the edge of the pipe as it flowed over.

Senator TALIAFERRO. So that there was more or less flow of water through the pipes at all of these borings, below what depth, would you say?

Mr. STEARNS. I did not say at all the borings; there were a few instances.

Senator TALIAFERRO. Only a few?

Mr. STEARNS. Only a few. They can all be picked out on that blueprint there.

Senator TALIAFERRO. I will ask you to pick out those depths—at what depth water first appeared, and to what depth it went.

Mr. STEARNS. In order to distinguish these, I will give what are called the stations. At station 20, plus 81, the water flowed one-quarter of an inch above the top of the casing from a point 32 feet below sea level down to a point 63 feet below sea level.

At Boring 23 plus 37 the water flowed with one-quarter of an inch depth on the pipe at a point 72 feet below sea level. At this same boring the water flowed with a depth of one-quarter of an inch from 170 feet below sea level down to 190 feet below sea level.

At Station 22 plus 40 the water flowed with a quarter of an inch depth over the casing from a point 124 feet below sea level.

At Station 27 plus 30 the water flowed with a quarter of an inch head above the casing from a point 151 feet to 169 feet below sea level. This is immediately over the indurated clay.

At Station 52 plus 67 there was a flow of one-quarter of an inch above the casing from 41 feet below sea level to 65 feet below sea

level; and from that same pipe a flow of one inch above the casing at 215 feet below sea level. This is in the porous pocket that has been referred to so many times.

At Station 54 plus 51 the water flowed $1\frac{1}{2}$ inches over the top of the casing from 192 feet below sea level down to 229 feet below sea level. This is also water from the porous pocket.

At one other point, at Station 56 plus 48, about 125 feet below sea level, there is a slight flow of water noted; no measurement.

That is all.

Senator TALIAFERRO. What distance do those several stations that you have enumerated cover across the site?

Mr. STEARNS. Including the high ridge in between the two, the greatest distance from the first one that I mentioned to the last one is 3,600 feet.

Senator KITTREDGE. Leaving out that hill, the central point?

Senator TALIAFERRO. Taking out the ridge.

Senator KITTREDGE. Within the distance where the borings were actually made?

Mr. STEARNS. If I divided it into two parts, one in one alluvial valley and the other in the other, I could tell you better.

Senator TALIAFERRO. State it in your own way, Mr. Stearns. Just adopt your own method.

Mr. STEARNS. In the alluvial valley of the island the most distant points at which water rose through the pipes were 650 feet apart; and in the alluvial valley west of the island the most distant points were 381 feet apart.

Senator KITTREDGE. Were there any borings made in those places that water did not appear?

Mr. STEARNS. Yes, sir.

Senator KITTREDGE. How many?

Mr. STEARNS. Five in the valley east of the island—

Senator HOPKINS. The island is the pocket you have spoken of in your previous testimony, is it not?

Senator TALIAFERRO. It is in the gulch.

Mr. STEARNS (continuing). And one in the other valley.

Senator KITTREDGE. In the valley which you first described those five places were a very short distance below the surface; they were not very deep, were they?

Mr. STEARNS. The shortest is 32 feet and the next shortest is 72 feet.

Senator KITTREDGE. You have said that in that pocket there were five. Three of those five borings went to what depth—the shortest borings? It is over at this side where you struck the indurated clay, is it not?

Mr. STEARNS. There is no water there.

Senator KITTREDGE. Well, those are the three of the five that you described?

Mr. STEARNS. As having no water?

Senator KITTREDGE. Yes.

Mr. STEARNS. Yes.

Senator KITTREDGE. Now, to what depth do those go?

Mr. STEARNS. I was going to say that those that showed no water as a rule were the shorter borings.

Senator KITTREDGE. In other words, when you got down to any depth you were almost certain to find water. Is not that the fact disclosed by that report?

Mr. STEARNS. I should say that it was, at some point in the depth.

Senator TALIAFERRO. These borings are immediately under the proposed dam?

Mr. STEARNS. Yes. I might add that I do not think the water being found there has any significance.

Senator TALIAFERRO. That is, of course, a question.

Senator HOPKINS. Why?

Mr. STEARNS. Because water is very generally found under such circumstances. It falls on the adjacent upland and gets down into the ground under a very slight increase of pressure. It may be only a barrellful or two barrellful, or something of that sort—not a great quantity—and if a pipe is driven it is very likely to come up. A number of these pipes were driven from a point more than 10 feet above the level of the Chagres River there, and if they had been driven from a level that was down near the river probably all of them would have shown some flow. If the water seeping in from the adjacent high ground to that will not find its way underneath there, it is almost sure that there is no more pressure in the interstices of any sand that is found than the pressure that is due to the head of the river above.

Senator HOPKINS. But the quantities are so infinitesimal that it can have no material effect on the land?

Mr. STEARNS. Oh, not at all; they mean nothing. They have no significance, except this freer flow that was found to exist in this deep pocket, and water would not flow so freely as to come up through 200 feet of pipe and when it got to the top rise an inch and a half above the top of the pipe if there was not free water-bearing material to bring it in at that rate. There is free water-bearing material, I think, down in that pocket that is 200 feet down.

Senator DRYDEN. Mr. Stearns, I want to revert again to the usable length of these locks. That is an important matter and there is a conflict of testimony in regard to it. Mr. Bates had a model here the other day, and by placing there a model of a ship relatively 788 feet long, I think, he showed that there was a space of only 2 feet left in the usable length of those locks. A subsequent witness, an engineer, testified that while the usable space in these locks from outer gate to outer gate was 900 feet long, the usable space from inner gate to inner gate was only 790 feet long.

I would like to ask, in the first place, whether these inner gates were the result of a second thought on the part of the engineers?

Mr. STEARNS. The inner gates, or the double gates, that you refer to were placed only on the summit level; and they are a safeguard against the possibility of any ship, by some mistaken notion—some mistaken understanding of signals—going through the locks, and making, as it might with a single lock, a breach through which the water of the lake could run out, causing disaster; and with the provisions which have been made of these double gates, and also a movable dam inside, there is a still further precaution, the double gates being probably sufficient for anything that might happen. They were provided for safeguards—not as an afterthought, but as a part of the design.

Senator DRYDEN. They were a part of the original design?

Mr. STEARNS. They were a part of the original design.

Senator DRYDEN. Then why is it reported to us that the usable length of those gates is 900 feet when it is really only 790 feet.

Mr. STEARNS. Well, it is not the case.

Senator DRYDEN. And yet two very prominent engineers have been misled.

Mr. STEARNS. I do not know whether they have seen the working drawings at the office of the Canal Commission on which those were based. As I have already stated, if they had taken it from this plan here, where the draftsman, in reducing those large drawings to a small scale, so as to put them on this plan, made a mistake, then they would find such results as you speak of.

Let me take, first, the two lower locks where there are no double gates. In those the distance from lock gate to lock gate is 955 feet; and the gates will swing so as to leave 900 feet of usable length. I have not verified this by actually swinging them myself, but that is what I was told continually. I looked at the plans this morning, and that is what they show. I did not try swinging the gates, but there was 955 feet of gross length, working out into 900 feet of usable length.

Now let us come to the upper lock. There are double gates at the upper end of it, and there are double gates at the lower end of it. At the upper end this measurement of 950 feet goes from the inner one of the two gates, but in measuring down to the lower end of that summit-level lock it was assumed that only one gate would be used if there was a ship 900 feet long; that is, the precaution that is provided against all ordinary operations would not be provided in the case of a ship 900 feet long. But on the contrary, the rule would be, I should assume—of course I do not know what the rules will be—but the rule should be made, with a ship that goes in there, with only a single gate, that it should be taken in with a tug and should not turn its propeller, and that it shall have its lines out and go in slowly. You know that if a 900-foot ship is in existence, going through that canal, it is not probable there would be any more than two or three in a year. The great bulk of ships are small. The big ship is the very rare thing. I think there are only six or seven or eight ships in existence—you probably have had that testimony before you—which are of this large size, and those are all on the North Atlantic route.

I have had a drawing made which might illustrate this to some extent. That [indicating drawing] shows a lock with 955 feet gross and 900 feet net length, in which the largest ship now in existence is placed. Here is one lock gate; there is the other lock gate, and that is the spare room. That is the *Baltic*. The *Carmania*, the biggest Cunarder that was launched, I think, last year—anyway, the largest now in service—which is 676 feet long by 73 feet wide, is shown by this black indication, and it shows how much leeway there is in a lock of that size.

Coming down to something that is not quite as large, here is the *St. Paul*, a boat that is well known as being one of the American Line, and that was used in the Spanish war as one of our fast scouts. It is one of the express steamers across the Atlantic, and you can see what length there is to spare with a ship of that kind.

Then I have put in here something more on the ordinary size of ship. There are four in the lock. That is based on dimensions given me for the largest coastwise steamers; and I take it that it covers also the steamers that go from New York to Cuba and to Panama and to Mexico—the largest size. The smaller ones, if they were put in there, might be packed in six at a time; and those are the ships that would ordinarily come to the canal.

It seems to me to be no disadvantage worth consideration—that it is not worth the additional money to lengthen that upper lock so as to take in this enormously large ship (which would come very rarely, if at all) with both gates closed.

Senator DRYDEN. But, Mr. Bates, these safety gates, if they are ever needed for a protection, would be needed in time of danger. Now, is not the time of danger the time when you have a big, powerful vessel, one of the largest and longest vessels afloat, in there? Is not that when the safety gates are going to be needed, if ever?

Mr. STEARNS. I do not think so; because if those vessels come only two or three times a year, there is no reason why an additional fifteen minutes should not be taken to carry them in, and the requirement be made that they shall not turn their propeller wheels. There is no danger to the gates if boats are put in slowly.

Senator DRYDEN. Then, if they are not to be used except when they are needed as a protection against the greatest danger, why are they there at all?

Mr. STEARNS. Because you have practically the same danger from a ship the size of the *St. Paul* that you would have from one of those largest ships. To make speed in getting in and out of those locks it is desirable, judging from the experience of the Soo Canal, that they should be permitted to use their own propellers and to go in with their own power. Now, that could be done, we will say, with a thousand ships in a year, and 2,000 or 3,000, whatever the number might be; and yet you could follow another rule of not permitting the very large ones that came only three times a year to do so, without interrupting the traffic of the canal.

Senator DRYDEN. Now, let me understand. Is it true that the usable space between these inner gates is but 790 feet? Is that true?

Mr. STEARNS. I do not think it is.

Senator DRYDEN. No; I understood you to say—

Mr. STEARNS. I think it only takes out 80 feet.

Senator DRYDEN. I understood you to say previously that you thought it was a draftsman's mistake.

Mr. STEARNS. I thought it might result from that. It is possible that between the inner gates it may be only 790 feet. I do not think it would need 110 feet between gates. I do not see why it should.

Senator DRYDEN. This is a matter, of course, which you are not in any way responsible for, but the query occurs to me, if we are misled in an important matter like this—and this is certainly a very important matter, as affecting this lock plan of canal—whether we have any security whatever in depending upon other measurements and drawings made here by the draftsmen?

Mr. STEARNS. Well, I do not think that the work of the draftsmen in procuring plans ought to be brought up against the consulting engineers, because these plans would never be used as a basis for construction.

Senator DRYDEN. I am sorry you did not understand me to say a moment ago that you were in no way responsible.

Mr. STEARNS. I so understand; let me say against the plan, rather than the consulting engineers; that is, nobody will ever work from this smaller plan to determine the size of the locks. They will take the figures as given by the consulting engineers if that plan is adopted, and the large scale drawings, which are correct, and not be governed by some little sketch of a plan which should have been right but is not.

Senator DRYDEN. Yes; that is true. But as regards the work of this committee you must bear in mind that we have to go by the drawings, maps, and plans submitted to us; and we have been asked and urged by competent engineers here to reject this plan, this being given as one of the reasons why we ought to reject it. Of course I ought not, perhaps, to press this as against you, because you are in no way responsible for it, but I want to ask one more question in connection with the location of the lock there.

It has also been said here that these locks could not be lengthened. Now, I understand you to hold the contrary view, and certainly one or two other engineers hold the contrary view.

Mr. STEARNS. I do not see how these particular locks could be lengthened. What would be done, in my opinion, if larger locks are needed, would be to build a third row of locks at this location [indicating]. If that [indicating] did not give you sufficient length right immediately beside these locks, then put them farther into the hill, where there is a greater length.

There is no reason that I can see why an additional lock should not be built there at any time when they are desired. They could be built in the beginning, adding roughly, I should say, \$30,000,000 to the cost, if the locks were made 125 feet wide by 1,200 feet long and giving three locks. But I think the information that we have shows that what is planned is sufficient for the present, and probably will be sufficient for thirty or forty years. Then the proper time will come for building larger locks if by any chance it should be found that enough ships of larger size wished to go through by the Isthmus.

This is what has been done in the past experience in canals. In the Soo Canal they built first a small lock. They could not have afforded the lock that was built more recently. Then they built another size; then the third lock, and now they are considering another larger one. That is much less expensive than it is to provide for a hundred years in the future.

Senator KNOX. What is the length of the largest lock at the Soo now; do you know?

General DAVIS. Eight hundred feet.

Mr. STEARNS. Eight hundred feet, I am told.

Senator DRYDEN. Can you suggest how we can get absolute information as to the usable length of these locks?

Mr. STEARNS. The information is the statement of the consulting engineers as to what they propose; and the only question, it seems to me, that might arise, would be whether there had been any mistake by which something should be made longer. Of course that is easily remedied by the expenditure of a very small sum; but there is no mistake, in my opinion. It was very carefully done by a good

engineer connected with the drafting work there under Mr. Noble's immediate direction.

Senator KNOX. The estimate made by the minority was for locks with a usable length of how many feet?

Mr. STEARNS. Nine hundred feet.

Senator KNOX. Of a usable length of 900 feet?

Mr. STEARNS. Yes.

Senator KNOX. And the estimate of cost is based upon having locks with that much usable length?

Mr. STEARNS. Yes; and you will understand that in the upper lock that usable length is obtained only by having the inner gate open for a very great ship.

Senator KNOX. I quite understand that; and then the lower locks would have an actual usable length of 900 feet all the time?

Mr. STEARNS. Yes.

Senator KNOX. And the upper lock might be shorn of the use of how many feet?

Mr. STEARNS. I think it is 80 feet.

Senator KNOX. What would be the greatest length of vessel which could occupy that upper lock with both gates shut, both the safety gate and the regular gate?

Mr. STEARNS. As nearly as I know, it would be 820 feet.

Senator KNOX. And there are no vessels of that length now?

Mr. STEARNS. There are none in existence at the present time.

Senator KNOX. No. Now, even assuming that in the next twenty years they grow to such enormous length—of course when you enter the lock the entering gates are not closed until after the vessel gets in the berth?

Mr. STEARNS. No; they should be closed, I will say, immediately as the vessel goes in.

Senator KNOX. At once; yes, sir; I understand. But there is nothing to prevent the use of a tug to control the motions of the vessel, so that she need not go in under her own power?

Mr. STEARNS. That is correct.

Senator KNOX. So that with a tug and with proper check lines you could bring the vessel up to within a very few feet of the lock gate with absolute safety, could you not?

Mr. STEARNS. Yes.

Senator HOPKINS. Even under that condition, where you used a tug and safety lines, you could throw open the inner gates and have the entire 900 feet, could you not?

Mr. STEARNS. I think that is what was stated.

Senator HOPKINS. Yes.

Senator KITTREDGE. Suppose you put a ship into a lock in the manner that Senator Knox has indicated, and stop it just before you reach the safety lock; how would you push it ahead? Would you use a windlass, or what?

Mr. STEARNS. Generally it would be done by a tug behind it.

Senator KITTREDGE. Pushing it?

Mr. STEARNS. Yes; or there might be winding machinery. That has been suggested, and a great many drawbridges and locks have apparatus to wind them ahead with a winch.

Senator KITTREDGE. Was that the plan that you had in mind?

Mr. STEARNS. I never have studied it at all for this place. I have for the lock that I am connected with elsewhere.

Senator KITTREDGE. That is a little bit of a lock, is it not?

Mr. STEARNS. It is not very large. It will take the ordinary small steamers that run on the coastwise trade.

Senator KITTREDGE. It is comparatively small, is it not?

Mr. STEARNS. It is, decidedly; or else these others are comparatively large.

Senator KITTREDGE. What is the largest ship now on the stocks?

Mr. STEARNS. It is said to be 800 feet by 88 feet by 36 to 38 feet draft. I have seen it differently stated. In fact, I have seen it stated as a little shorter than 800 feet.

General DAVIS. Seven hundred and eighty-eight feet.

The CHAIRMAN. Do you mean the Cunard ship?

Mr. STEARNS. Yes, sir.

The CHAIRMAN. She is either 780 or 788.

Mr. STEARNS. I think there is no expectation that such a ship will ever get through the canal; or, at least, the United States will not be very much interested in having it. The United States could not obtain that ship in case of war, I believe, as it is subsidized to the British Government.

Senator KNOX. Even if you wanted 50 to 100 feet more of usable length in those locks, as I understood you a few moments ago, there is no reason why the locks can not be built to get it?

Mr. STEARNS. No.

Senator KNOX. It is only a question of a little more money?

Mr. STEARNS. It is a question of money. It would cost, judging from some very preliminary estimates, about \$4,000,000 more to make those locks 100 feet wide with 1,000 feet usable length than to make them 900 by 95.

Senator KITTREDGE. I understood you to say to me that there was a question about getting a good foundation, too.

Mr. STEARNS. I do not think so. I think there is plenty of room for it.

I prepared some sections a short time ago, of which I have photographs here, showing one of those Cunarders that have not yet been launched, and I should acknowledge my indebtedness for the picture of the Cunarders to the Scientific American. I have shown them in sections of canal that are 150 feet wide, as proposed by the majority, and with sections 300 feet and 500 feet in width, as proposed by the minority. I have not included the 200-foot section in the lock, or the 1,000-foot section. They look as if they made rather a close fit in a 150-foot channel and very close to the bottom.

Senator KITTREDGE. They were taken that way, were they not? They were taken in the right position to show that, were they not?

Mr. STEARNS. They are a correct drawing as far as the width of the ship is concerned, and the depth and the width of the canal is concerned; and they show one ship in a canal—

Senator HOPKINS. That is under the sea-level plan, is it?

Mr. STEARNS. Yes; and also two other sections under the lock-canal plan, where the depth is 45 feet. You will see in those two wider sections that they show more water underneath and more water at the sides; and it certainly looks as if it would be more comfortable, especially if a ship were coming in the opposite direction. And it

should be remembered that even those ships are not as large as can be passed through these locks proposed by the minority.

There is one matter that occurs to me, in view of the statement that this canal is wider than the Suez Canal—that is, that the sea-level canal is wider than the Suez Canal.

The Suez Canal, as I understand, has a bottom width of from 108 to 118 feet. The ships that go through it—I picked out the four largest that were mentioned by Mr. Quellenec in giving us some statement as to the largest ships that went through the canal. They have there a length of 560 feet by 62 by 26, 500 by 71 by 26, 400 by 76 by 26, and 390 by 75 by 26. While there is one, a battle ship, which is very wide in proportion to its length—that is, 400 feet long and 76 feet wide—I do not think that they offered the difficulty to navigation that would be offered by a very long ship, and it is proposed to allow, say, a 93-foot ship to go through this canal, even in the minority plan, as against the widest one there of 76. But if that 93-foot ship should also be long, it seems to me it would be much more difficult to navigate in a canal, because if a boat occupying the large part of the section gets started a little to one side the water which is rushing back past the ship to prevent a vacuum behind it tends to crowd it over to one side.

Senator KITTREDGE. Mr. Stearns, may I return to this picture a minute?

Mr. STEARNS. Certainly.

Senator KITTREDGE. What is the draft of these boats?

Mr. STEARNS. It was originally given in a statement made to us by the Isthmian Canal Commission as 36 feet in salt water. I have seen a more recent statement as 38 feet. That is drawn as if it were 38 feet.

Senator KITTREDGE. What boat is this?

Mr. STEARNS. One of the two unnamed Cunarders that have not yet been launched.

Senator KITTREDGE. And what is their length?

Mr. STEARNS. About 800 feet. It is stated here as 788 feet.

Senator KITTREDGE. You say the draft is how much?

Mr. STEARNS. Thirty-six.

Senator KITTREDGE. That leaves them 4 feet of water?

Mr. STEARNS. If the canal has the full depth; yes.

Senator KITTREDGE. That is all there is to these pictures, is it not?

Senator TALIAFERRO. You have not a picture of one of the Cunarders in a lock?

Senator KNOX. Well, that is all the pictures purport to show, is it not? I do not understand that the pictures are intended to convey any other idea, are they, Mr. Stearns? These photographs are not intended to convey any idea to us except to show the relative size of the ships in the water in the lock and in the sea-level canals?

Mr. STEARNS. It was thought that a graphic representation would be an easy way and a satisfactory way to judge of the relative size of the ship and the section of the canal.

Senator TALIAFERRO. As a practical argument in favor of the lock canal?

Mr. STEARNS. I should think so—in favor of wide channels.

Senator TALIAFERRO. And deep draft?

Mr. STEARNS. And plenty of room under the boat. They steer badly, so I am told.

It is stated in the report of the majority (as having, I think, some bearing upon the question of canals) that all of the canals of the world, with one exception, were being widened; and then it added, "As this is going to press we learn that the other one is being widened, too." The tendency is very strongly in favor of wide channels, although ships get through narrow ones; and I believe myself that the wide channels and the deep channels have an immense advantage in navigation as regards safety.

Senator, your attention has been called to the question as to how often ships go aground in the Suez Canal. The only statistics available were some that were gathered in 1899 or 1900, at the time of the original Isthmian Canal Commission; and I would like to read those statistics to you, if they have not been called to your attention.

Senator KITTREDGE. Are they in the report?

Mr. STEARNS. They are in the report.

Senator KITTREDGE. If you will call our attention to the pages, that will be sufficient so far as I am concerned.

Mr. STEARNS. If that is all that is desired, the statement may be found on page 93.

Senator HOPKINS. If it is short, I would like to have it in connection with your testimony.

Mr. STEARNS. It is. These statistics were taken from the records of the Suez Canal and show the delays to traffic from ships grounding during a period of eight months, from January to August, 1899, inclusive. No delay of less than six hours was included. The groundings of more than six hours were 15 in number, the aggregate delays to the grounded ships being two hundred and ninety-two hours and twenty-nine minutes. In 14 of the 15 cases the channel was blocked so that other ships could not pass, the total time during which the canal was blocked being one hundred and eighty-five hours and forty-six minutes.

There are also, on this same page and in an appendix, statements of the blockades that have occurred in the channels in connection with the St. Marys Canal and St. Clair River. In one case the blockade continued for five days; 332 vessels were delayed, and the loss to navigation amounted to a large sum, estimated to be \$600,000. That is an estimate which, I understand, was made long ago and in connection with this particular work.

Senator TALIAFERRO. Does the report deal at all with delays occasioned in the lake plan?

Mr. STEARNS. It does, in great detail, as to the time of passage through locks. Mr. Noble has worked that out.

Senator TALIAFERRO. I mean delays by accidents. Do you know of any accidents that have occurred in the locks of any of the existing canals?

Mr. STEARNS. Yes. No ship has ever been injured in fifty years at the St. Marys Falls Canal. When I say "injured," I mean seriously injured. There have been little portions of a ship broken by coming in contact with gates or something, but no ship has been seriously injured.

The danger of accidents in a lock are not to the ship, because it moves there very slowly and practically the same as it would in

coming up to a wharf—even under better conditions, because the pier to which it comes is parallel with the line of navigation. Almost all wharves have only narrow ends, and there are currents near them.

Senator TALIAFERRO. I was speaking of the canal, Mr. Stearns, not the ship.

Mr. STEARNS. Oh, yes.

Senator TALIAFERRO. Do you know of any accidents that have occurred in the locks of any existing canals?

Mr. STEARNS. Yes; not of my own personal knowledge, but I have acquired this information.

Senator TALIAFERRO. I mean in the same way that you have acquired the information about the groundings in the Suez Canal?

Mr. STEARNS. Yes. There were three times when ships coming through the Manchester Ship Canal have gotten the wrong signals, or the signals have been wrongly understood, and they have turned their propellers and gone ahead instead of backing, with the result that the lock gates have been torn away, I think, on three occasions.

Senator KITTREDGE. Within what period?

Mr. STEARNS. Within the period of its existence. I do not know the dates. I think these have all occurred with ships that were going downstream, and it is the policy to close the gates behind them after they get into the locks—the upper gates. They were in the process of closing those gates and the ship went through the gates below and the upper gates came to with a bang. The ship did not get injured, I believe, in any case. It was either two or three times that that happened.

General DAVIS. Three times, I think.

Mr. STEARNS. There were three accidents in all. The ship did not get injured in either case there, and in both cases the upper gates swung together in such a way that they held and prevented the lock from becoming a mill race with the water rushing through it.

Senator DRYDEN. That was on the Manchester Canal?

Mr. STEARNS. Yes. There has never been an accident that has disabled the canal further than to put those locks out of commission; and that is provided against in the canal at Panama by the duplicate locks.

Senator DRYDEN. And no accident of that kind has occurred in any other canal that you know of?

Mr. STEARNS. There have been three somewhat similar accidents at the St. Marys Falls Canal. I do not remember those as well. One was in the case of a ship coming up from below, and it struck the lower gates, which had water against them, and pushed them open a little ways; then the force of the water reacted, and sent the ship back as if it had been an arrow from a bow, I believe.

Senator KNOX. What would happen, Mr. Stearns, if a ship were coming through this flight of locks, and she were to run through the gate of the upper lock?

Mr. STEARNS. The provision is made so that the vessels shall not run through.

Senator KNOX. By that safety gate?

Mr. STEARNS. By the safety gate.

Senator KNOX. Well, if that did not work?

Mr. STEARNS. But if you assume that the vessel went through both (which would not happen) there would nothing happen, provided the upper gates had been closed in due season after the ship went into the lock, if they closed up very quickly behind it, except to demolish the gates; and I think the ship might get into trouble.

Senator KNOX. That situation was described here by some witness as a possibility. He thought very serious damage would be done to the locks—almost irreparable damage.

Mr. STEARNS. I think that the precautions that are taken by those double gates—they must be very heavy gates in a canal of that sort—would be sufficient. But if they were not, the minority has provided \$2,000,000 in its estimate for putting up what are known as movable dams, and thirteen different plans for movable dams had been studied on the Soo Canal, and there was no question as to the feasibility of designing them; but within three months we could not do everything.

Senator KNOX. No.

Mr. STEARNS. So that that was put in as a sum of money, without providing the design. But those movable dams would be so arranged that they could be closed, and if a current should get started they would be closed immediately. It would not be possible, probably, to close those upper gates; the rush of water would make them come to with such a bang that they would probably be destroyed.

Senator HOPKINS. As I understand you, it is a very remote contingency that there would ever be accidents in the locks?

Mr. STEARNS. It has never happened with any canal in the world, with only single gates, so as to cause disaster. It breaks the gates; but with these double-gate precautions and all the provisions that can be made in management to take care of the matter, I do not believe there is the slightest danger.

Senator HOPKINS. As I understood you to say, for fifty years at the Soo, up here, they never have had even an accident of that kind?

Mr. STEARNS. Not to the ship; but they have had accidents that have broken the locks.

Senator HOPKINS. Yes.

The CHAIRMAN. Mr. Stearns, are you getting pretty well along with your statement?

Mr. STEARNS. I have very little more to say. There are one or two things that might be of interest.

The CHAIRMAN. We would like to have you go right along with them, then.

Mr. STEARNS. One I forgot to state, in connection with the maintenance of the canal. A ship going through a canal causes waves to flow out to the side, which wash against the sides; and if they are left in earth they would wash that earth down into the bottom of the canal. That is an additional cost in maintenance of the sea-level canal, because there would be the whole distance between the shore lines where that washing action would take place, and those waves are quite considerable if boats go with any reasonable degree of speed. Of course it would not occur in the sections which have rock sides; only where there are earth sides.

In the lock canal the greater part of this is lake navigation, where the waves would go away off to the shores, a long distance from the canal; and consequently they would not wash the material into the

canal. It is quite an important item in the cost of maintaining the canal.

The amount of earth canal on the sea-level section is, I think, between 21 and 22 miles. I do not know the exact figures; that is about it. On the lock canal the only sections in earth are $2\frac{1}{2}$ miles down to Limon Bay, and those are 500 feet wide, where the material, if it did wash from the edges, would not wash as much, it being farther from the ships which pass; and also, it would probably be deposited out toward the edges, leaving the middle to the larger depth.

No sum was included in either estimate for riprapping or paving the sides of the canal so that that washing would not occur except to a moderate extent. It would be quite a large item on the sea-level canal and a very small item if it were done on the lock canal; but I do not think it will be necessary on the lock canal, in view of the very great depth of channel.

Considerable has been said in the testimony with regard to leaving the tidal lock open. I do not think that is a feasible thing; and I quote practically what was said by one of the foreign members, who had had experience in that line. I think it was at a canal, the Kiel Canal, where there is not nearly the rise and fall of the tide that there is on the Panama side. I am not sure as to the rise and fall of the tide there, however.

General DAVIS. It is small.

Mr. STEARNS. It is small. But even under those conditions he said that they left the gates of their tidal locks open for a time, and they got a petition or a request from the shipowners that they should close those gates and let them lock through; it was too dangerous going through with the water rushing through. It seemed to be conclusive, in his mind, that tidal locks ought to be kept closed. And that was under conditions which are much more favorable to keeping them open than at Panama. If they should be kept open at Panama, with a rise and fall of the tide of, say, 6 feet above and below mean tide in ordinary neap tides, or with the lower tides, it would produce a very great rush of water through those locks and through the portion of the canal near the locks, which I should think would be dangerous. It would not only do that, but it would also diminish the depth of the canal at low tide, because the water would fall with the tide.

I think those are all of the single topics that I had to discuss. The question has been suggested as to what my view was as to the canal as a whole in the comparison of sea-level and lock canals.

The CHAIRMAN. I would like to have your opinion in regard to that. If you were going to own both canals, which one you would think the best, for the same money and the same time in its construction?

Mr. STEARNS. I have given that matter very careful consideration. It seems to me that a canal is a means of getting ships across the Isthmus; that it is a question of getting them across, in the first place and most important, safely, and, next in importance, to get them across quickly. In both of those respects I believe the lock canal is the best. It has within its depths and widths ample channels which will permit speed and safety, for while groundings occur in wide channels they occur much more frequently in narrow channels.

I believe that the lock canal has the greater capacity for traffic. When one imagines the traffic approaching 60,000,000 to 80,000,000 tons per year it will be realized that it would not be practicable to get them through if one ship had to be tied up for every other one that passed, there would be so many in the canal at one time. There would be a demand for widening the sea-level canal before any demand would come for the enlargement of the lock canal, except as individual ships might get to be so large as to require another set of locks, which would not be very costly.

Taking all those things into account, I believe that for the same time and money the lock canal is the better canal. I would give more for it.

Senator KNOX. There are locks on the sea-level canal as well, are there not?

Mr. STEARNS. One—or one pair.

Senator KNOX. One pair of locks?

Mr. STEARNS. Yes.

Senator KNOX. Where are they located?

Mr. STEARNS. Close to the Panama shore.

Senator KNOX. And do you know what the usable lengths of those locks are?

Mr. STEARNS. They are 1,000 feet long and 100 feet wide.

Senator TALLAFERRO. What is the lift?

Mr. STEARNS. The lift varies from nothing to about 10 feet.

Senator KNOX. Well, there is just the same chance of accident to gates and to ships in one of those locks as there would be in any other lock—in one of the sea-level locks?

Mr. STEARNS. There is the same accident danger to ships, but that is very small in any lock. There is the same danger of smashing a gate, but the result of smashing a gate would not be as serious as it would be in a summit-level lock.

Senator KNOX. Yes; I understand. That is all.

Mr. STEARNS. I might say in connection with that matter of the size of locks that if ships continue to increase in size, following the history of the past, that probably the difference in size between the locks that are 900 feet in usable length and those that are 1,000 feet in usable length would be reached in the difference in the time of construction of the canals.

That is, that if the lock-canal locks were outgrown in twenty years after the completion of the lock canal the sea-level canal locks would be outgrown in twenty years after the completion of the sea-level canal. That is, a difference of six years would account for a difference of 5 feet in width and a hundred feet in length.

The CHAIRMAN. Mr. Stearns, have you anything further to suggest to the committee?

Mr. STEARNS. No, sir; I think not.

The CHAIRMAN. I think, then, we will excuse you now; and we certainly appreciate your coming, and thank you very much for being here.

(The committee thereupon adjourned until Tuesday, March 20, 1906, at 10.30 o'clock a. m.)

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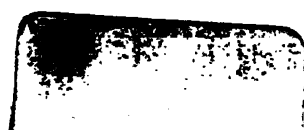
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